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Ninety-Day Subchronic Oral Toxicity Study  
of Nitroguanidine in Mice

Denzil F. Frost, MS, DVM, CPT, VC  
Earl W. Morgan, DVM, MAJ, VC  
Yvonne Letellier, BS  
Michael J. Pearce, MA  
Suellen Ferraris, PhD  
C. Dahlem Smith, DVM, MAJ, VC  
Gary M. Zaucha, DVM, CPT, VC  
and  
Don W. Korte, Jr., PhD, MAJ, MSC

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November, 1988

Toxicology Series: 200

LETTERMAN ARMY INSTITUTE OF RESEARCH  
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**Ninety-Day Subchronic Oral Toxicity Study of Nitroguanidine in Mice (Toxicology Series 200)--Frost *et al***

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**Edwin S. Beatrice** (date)  
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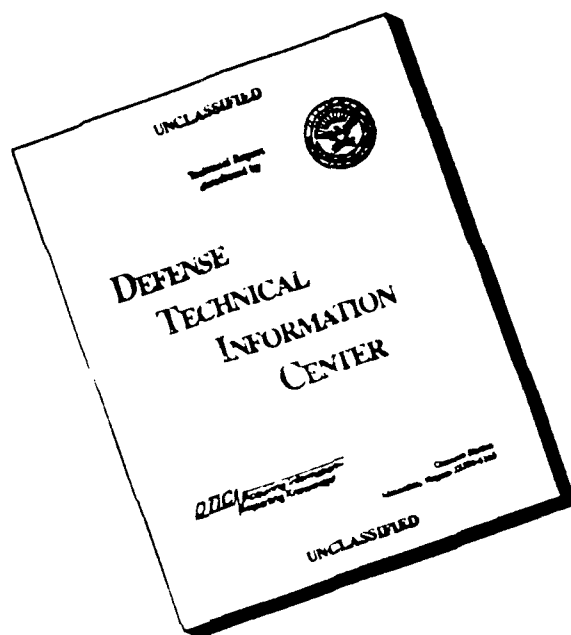
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dosing. Microscopic examination of tissues from the control and 1000 mg/kg/day-dose-group animals revealed no lesions attributable to the administration of nitroguanidine. These findings indicate that nitroguanidine is nontoxic in mice when administered at doses as high as 1000 mg/kg/day for 90 days. The findings of increased water consumption suggest that nitroguanidine, which is excreted unchanged in the mouse's urine, may be acting as an osmotic diuretic.

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# ABSTRACT

The 90-day subchronic oral toxicity of nitroguanidine was evaluated in male and female ICR mice. Nitroguanidine was administered in the diet at dose levels of 0, 100, 316, and 1000 mg/kg/day for 90 days. The addition of nitroguanidine to the diet had no effect on food consumption or weight gains, but there was a significant dose-response increase in water consumption. Clinical signs attributable to the test compound were not observed during the study. Blood samples taken at necropsy for hematological analysis exhibited no significant abnormalities that could be attributed to nitroguanidine dosing. Several serum chemistry parameters did exhibit statistically significant ( $p \leq 0.05$ ) alterations from the control values, but these changes were isolated occurrences with no consistent dose-related trends being noted. With the exception of the brain-to-body weight ratio in the high-dose males, organ weights and their respective ratios were not significantly affected by dosing. Microscopic examination of tissues from the control and 1000 mg/kg/day-dose-group animals revealed no lesions attributable to the administration of nitroguanidine. These findings indicate that nitroguanidine is nontoxic in mice when administered at doses as high as 1000 mg/kg/day for 90 days. The findings of increased water consumption suggest that nitroguanidine, which is excreted unchanged in the mouse's urine, may be acting as an osmotic diuretic.

Key Words: Subchronic Oral Toxicity, Nitroguanidine, ICR Mice, Triple base propellants; (ICT)

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## **PREFACE**

**TYPE REPORT:** 90-Day Subchronic Oral Toxicity GLP Study Report

**TESTING FACILITY:**

US Army Medical Research and Development Command  
Letterman Army Institute of Research  
Presidio of San Francisco, CA 94129-6800

**SPONSOR:**

US Army Medical Research and Development Command  
US Army Biomedical Research and Development Laboratory  
Fort Detrick, Maryland 21701-5012  
Project Officer: Gunda Reddy, PhD

**WORK UNIT/APC:** 180 Environmental Health Effects of Army  
Materials/TL09

**GLP STUDY NUMBER:** 86007

**STUDY DIRECTOR:** MAJ Don W. Korte Jr., PhD, MSC  
Diplomate, American Board of Toxicology

**PRINCIPAL INVESTIGATOR:**

CPT Denzil F. Frost, MS, DVM, VC  
Diplomate, American College of Veterinary Preventive  
Medicine.

**CO-PRINCIPAL INVESTIGATOR:**

MAJ Earl W. Morgan, VC  
Diplomate, American College of Veterinary Preventive  
Medicine and American Board of Toxicology

**PATHOLOGIST:** MAJ C. Dahlem Smith, DVM, VC  
Diplomate, American College of Veterinary  
Pathologists.

**REPORT AND DATA MANAGEMENT:**

A copy of the final report, study protocol, retired  
SOPs, raw data, analytical, stability, and purity data  
of the test compound, and an aliquot of the test  
compound will be retained in the LAIR Archives.

**TEST SUBSTANCE:** Nitroguanidine

**INCLUSIVE STUDY DATES:** 18 March - 2 July 1987

**OBJECTIVE:** The objective of this study was to determine the  
90-day subchronic oral toxicity of nitroguanidine  
in male and female ICR mice.

### **ACKNOWLEDGMENTS**

SPC Dean Magnuson, BS, SPC Joel Seewald, BS, SGT Charles Freedman, and SGT Tammie Heineman provided research assistance and animal care; SGT John R.G. Ryabik, BS, provided chemical preparation and analysis; MAJ Luanne McKinney, DVM, ACVP, CPT Harry L. Walker, DVM, SGT Thomas W. Johnson, BA, and Nancy Smith provided necropsy and pathology support; SPC Patrick Patterson provided hematology support; Mary E. Lyons provided clinical chemistry support.



**SIGNATURES OF PRINCIPAL SCIENTISTS AND MANAGERS  
INVOLVED IN THE STUDY**

We, the undersigned, declare that GLP Study 86007 was performed under our supervision, according to the procedures described herein, and that this report is an accurate record of the results obtained.

*Don W. Korte Jr. 5 Dec 88*  
DON W. KORTE JR., PhD/DATE  
MAJ, MSC  
Study Director

*C Dahlem Smith 5 Dec 88*  
C. DAHLEM SMITH, DVM/DATE  
MAJ, VC  
Pathologist

*Denzil F. Frost 5 Dec 88*  
DENZIL F. FROST, MS, DVM/DATE  
CPT, VC  
Principal Investigator

*Vivonne Letellier 5 Dec 88*  
VIVONNE LETELLIER, BS/DATE  
DAC  
Co-Principal Investigator

*Earl W. Morgan 24 Jun 87*  
EARL W. MORGAN, DVM/DATE  
MAJ, VC  
Co-Principal Investigator

*Michael J Pearce 3 Nov 88*  
MICHAEL J. PEARCE, MA/DATE  
DAC  
Co-Author

*Suellen Ferraris 5 Dec 88*  
SUELLEN FERRARIS, PhD/DATE  
DAC  
Analytical Chemist

*Gary M. Zaucha 5 Dec 88*  
GARY M. ZAUCHA, DVM/DATE  
CPT, VC  
Co-Author



REPLY TO  
ATTENTION OF:

DEPARTMENT OF THE ARMY  
LETTERMAN ARMY INSTITUTE OF RESEARCH  
PRESIDIO OF SAN FRANCISCO, CALIFORNIA 94129

SGRD-ULZ-QA

5 December 1988

MEMORANDUM FOR RECORD

SUBJECT: GLP Compliance for GLP Study 86007

1. This is to certify that in relation to LAIR GLP Study 86007, the following inspections were made:

09 February 1987	- Protocol Review
02 April 1987	- Feed Mixing
02 April 1987	- Weighing of Feeders & Water Bottles
11 May 1987	- Eye Exam, Interim Sac. Animals
13 May 1987	- Interim Sacrifice, (Males)
01 July 1987	- Final Observation & Weights (Males)
01 July 1987	- Final Sacrifice (Males)

2. The institute report entitled "Ninety-Day Subchronic Oral Toxicity Study of Nitroguanidine in Mice," Toxicology Series 200, was audited on 7 November 1988.

*Carolyn M. Lewis*

CAROLYN M. LEWIS, MS  
Diplomate, American Board of Toxicology  
Chief, Quality Assurance

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# Ninety-Day Subchronic Oral Toxicity Study of Nitroguanidine in Mice -- Frost et al

## INTRODUCTION

Nitroguanidine, a primary component of US Army triple-base propellants, is now produced in a Government-owned contractor-operated ammunition plant. The US Army Biomedical Research and Development Laboratory (USABRDL), as part of its mission to evaluate the environmental and health hazards of military-unique propellants generated by US Army munitions-manufacturing facilities, conducted a review of the nitroguanidine data base and identified significant gaps in the toxicity data (1). The Mammalian Toxicology Branch, Letterman Army Institute of Research (LAIR), was tasked by USABRDL to develop a genetic and mammalian toxicity profile for nitroguanidine, related intermediates/by-products of its manufacture, and its environmental degradation products.

### Objective of the Study

The objective of this study was to determine the 90-day subchronic toxicity of nitroguanidine in male and female ICR mice.

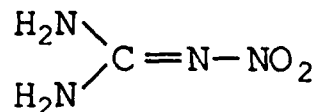
## MATERIALS

### Test Substance

Chemical name: Nitroguanidine

Chemical Abstract Service Registry No.: 556-88-7

Structural formula:



Molecular formula: CH<sub>4</sub>N<sub>4</sub>O<sub>2</sub>

Other test substance information is presented in Appendix A.

### Vehicle

The test compound was mixed into the feed (see Husbandry).

### Animals

Seventy-three male and 73 female ICR mice (Harlan Sprague Dawley, Inc., Indianapolis, IN) were used in this study. Tail tattoos were used to identify each animal individually. Three males and 3 females with the lowest body weights were selected for necropsy quality control. Ten males and 10 females were used as baseline controls. The body weights on receipt (18 March 1987) ranged from 17 g to 23 g. Additional animal data appear in Appendix B.

### Husbandry

The animals assigned to this study were housed individually in clear, polycarbonate shoe boxes in drawer rack cages. Alpha-Dri™, a cellulose fiber, was used as bedding. The shoe boxes and bedding were changed twice weekly. The diet, fed *ad libitum*, consisted of Certified Purina Rodent Chow® 5002 Meal Form (Ralston Purina, St. Louis, MO). Water was provided by 16-ounce water bottles with stoppers and sipper tubes. Both feed and water consumption were measured weekly.

The temperature range maintained throughout this study was 16.0°C - 25.0°C with a relative humidity of 24-60% with occasional periods up to 80% for several hours. The photoperiod was 12 hours of light daily with a 1/2-hour dawn phase-in and a 1/2-hour dusk phase-out.

## **METHODS**

This study was performed in accordance with LAIR Standard Operating Procedure OP-STX-74 "Ninety-Day Subchronic Oral Toxicity Testing in Rodents" (2) and EPA guidelines (3).

### Group Assignment/Acclimation

The animals were acclimated for 14 or 15 days (males and females, respectively) from receipt to the onset of dosing. During the acclimation period the animals were observed daily for signs of illness. Food and water consumption were measured during the second week of quarantine.

Fifteen animals of each sex were assigned to each of 4 dose groups. A fifth group of 10 animals of each sex was identified as the baseline data group. Allocation was accomplished using a computer-based, stratified, weight-biased randomization method (LAIR SOP OP-ISG-24).

#### Dose Levels

Dose levels were selected on the basis of the results of an acute toxicity study (4) and a pilot study. The acute oral median lethal dose exceeded a LIMIT dose of 5000 mg/kg. Thus, the upper dose level used in the pilot study was a LIMIT dose of 1000 mg/kg (3). At this dose level no deaths nor obvious toxicity were observed. Using a logarithmic progression table the following dose levels were selected: 0 mg/kg/day, 100 mg/kg/day, 316 mg/kg/day, and 1000 mg/kg/day.

#### Compound and Diet Preparation

The nitroguanidine was received as a dry white powder. All diet preparations were done in accordance with LAIR SOP OP-STX-16 (5). A premix consisting of 50 mg nitroguanidine/kg of the Rodent Chow was prepared. Since the compound tends to clump, it was further ground in a jar mill (Norton Inc., Akron, OH) using porcelain grinding pellets for one hour to break up the clumps. The nitroguanidine was then mixed into the meal in a series of 1-, 2-, 4-, and 6-fold dilutions. Each dilution was mixed for 15 minutes in the jar mill. The dilutions were then sieved through a 10-mesh screen to ensure the grinding was complete and to remove the grinding pellets.

On the day of the diet change, after the new diet concentrations had been calculated, the appropriate amounts of premix and meal were blended together using a Twin-Shell Dry Blender (Patterson-Kelley Co., Division of Harsco Corp., East Stroudsburg, PA) for at least 15 minutes. Nitroguanidine was mixed into the feed at a level that, based on the feed consumption of the previous week and the animal's weight, would provide the desired dose (mg/kg) on a daily basis. All diet mixes were within 10.0% of target concentration and were adequately homogeneous. Additional mixing data and analyses are presented in Appendix C.

#### Test Procedures

Feed consumption and water consumption were measured on a weekly basis. Individual feed jars were used. They were weighed at the beginning and at the end of each week. The feed was sifted using a 10-mesh sieve to remove bedding and

feces prior to the final weighing. If there were signs of spillage in the bedding, the bedding was also sifted and the feed obtained was returned to the jar prior to weighing. Records for water bottles with obvious spillage and for feed jars with spillage contaminated with moisture were flagged, and the weights were omitted. Record-keeping was initiated during the final week of quarantine and provided the baseline consumption data to calculate the first week's diet mixture.

Early on the day of diet change, the animals were weighed, observed, and their water bottles and feeders were weighed. These data were collected on a Beckman TOXSYS® data collection terminal. The Beckman Diet Computation Subsystem was used for the calculations. After the new diet was mixed, the feeders and water bottles were filled, weighed, and returned to the cages.

Observations were performed twice daily throughout the 90-day test period. During the morning observations, the animals were observed undisturbed in their cages, outside of their cages, and after return to their cages. All findings were recorded. A second "walk through" observation was performed in the afternoon, and only significant observations were recorded. Body weights were recorded weekly and on the day of sacrifice. Appendix D contains a listing of the historical events.

All animals were subjected to a complete gross necropsy following exsanguination under sodium pentobarbital anesthesia. Blood was collected from the right ventricle while under anesthesia for hematology and clinical chemistry measurements. A listing of the measurements and SOPs is provided in Appendix E. Full histopathology was performed on the organs and tissues listed in Appendix F of all mice in the control and high-dose groups. In addition, histopathology was performed on the brain, lungs, liver, kidneys, urinary bladder, and gall bladder of all study animals.

#### Changes/Deviations

Due to a shortage of ear tags, tail tattooing was used for animal identification.

Six animals were submitted for quality control necropsy instead of 4.

On Day 1 of the study, animal 87C00133 was unable to obtain water due to problems with its water delivery system and became dehydrated. This animal was replaced by animal



87C00176. Due to the mechanics of programming, it was not possible to implement this change in the computer system. Therefore, animal 87C00176 is listed as 87C00133 in the pathology XYBION printouts.

Clinical observations were performed but inadvertently not recorded due to procedural errors on 2, 9, and 16 April and 15 April 87 for the males and females, respectively.

Serum chemistry analyses were not performed for the following animals due to insufficient sample volume: 87C00-055, 059, 068, 081, 083, 099, 134, 154, 161, 162, 174, and 178. The "n" values for various serum chemistries often differ from the group size because insufficient sample volume was obtained to make all measurements for each animal.

Hematology measurements on the interim sacrifice females and white blood count differentials on the interim sacrifice males were not obtained due to operator error.

These deviations did not significantly affect the interpretation of the study results.

### Statistics

The animal weights, food consumption, and water consumption were analyzed statistically with packaged programs available on BMDP software (7). The equality of the variances of the groups was tested using the Levene's Test. If the variances were equal, the vehicle control group and the dose groups were compared by the standard one-way analysis of variance (ANOVA). Otherwise, the Welch one-way ANOVA, which is not based on the assumption that the variances are equal, was performed. If the F-statistic was significant in either case, the Dunnett's test was performed to determine whether or not the vehicle control group was significantly different from any of the dose groups. There was insufficient bilirubin data to perform statistical analysis. Statistical analysis for organ weights, hematology and serum chemistry were done on the Xybion software program using the standard one-way ANOVA. The homogeneity of the groups was tested by the Bartlett's test. If the groups were found to be non-homogeneous, then a modified t-test was performed instead of the Dunnett's test.

### Storage of Raw Data and Final Report

A copy of the final report, study protocols, raw data, retired SOPs, and an aliquot of the test compound will be retained in the LAIR Archives.

## RESULTS

### Mortalities

No deaths occurred during the study.

### Food, Nitroguanidine, and Water Consumption

Mean daily consumption of nitroguanidine is presented in Table 1. Individual consumption of nitroguanidine is presented in Appendix F. Mean weekly food and water consumption data are presented in Tables 2 and 3, respectively. Individual food and water consumption data are presented in Appendices G and H, respectively. No statistically significant ( $p \leq 0.05$ ) dose or compound-related effects were observed in food consumption. Nitroguanidine consumption in the food ranged from 77 to 1211 mg/kg/day. Water consumption increased significantly ( $p \leq 0.05$ ) in the female 1000 mg/kg/day group for weeks 1 and 2. Water consumption increased significantly ( $p \leq 0.05$ ) in the male 1000 mg/kg/day group for weeks 1 through 13 when compared to the controls. The 100 mg/kg/day males showed a significant decrease in water consumption for week 6 when compared to the controls ( $p \leq 0.05$ ).

### Body Weights

The mean body weights for each group are presented in Table 4. No statistically significant dose or compound-related effects were observed in male or female body weights. Individual body weight data are presented in Appendix I.

### Clinical Signs

No clinical signs attributable to nitroguanidine administration were observed. The incidence of signs such as irritability, aggressive behavior, ocular changes, alopecia, hyperactivity, chewing, dehydration, twitching, and increased startle reflex appeared to be random, often isolated occurrences, and a function of a subchronic study rather than compound or dose related. A summary of clinical observations is presented in Table 5. Individual clinical signs data are presented in Appendix J.

**Table 1: Daily Consumption of Nitroguanidine#**

Group	Week	n	Males (mg/kg/day)	n	Females (mg/kg/day)
Controls	1	15	0* $\pm$ 0	15	0 $\pm$ 0
	2	15	0 $\pm$ 0	15	0 $\pm$ 0
	3	15	0 $\pm$ 0	15	0 $\pm$ 0
	4	15	0 $\pm$ 0	15	0 $\pm$ 0
	5	15	0 $\pm$ 0	15	0 $\pm$ 0
	6	15	0 $\pm$ 0	15	0 $\pm$ 0
	7	10	0 $\pm$ 0	10	0 $\pm$ 0
	8	10	0 $\pm$ 0	10	0 $\pm$ 0
	9	10	0 $\pm$ 0	10	0 $\pm$ 0
	10	10	0 $\pm$ 0	10	0 $\pm$ 0
	11	10	0 $\pm$ 0	10	0 $\pm$ 0
	12	10	0 $\pm$ 0	10	0 $\pm$ 0
	13	10	0 $\pm$ 0	10	0 $\pm$ 0
100 mg/kg/day	1	12	95 $\pm$ 4	15	77 $\pm$ 6
	2	15	85 $\pm$ 2	15	115 $\pm$ 5
	3	14	85 $\pm$ 4	15	91 $\pm$ 4
	4	15	83 $\pm$ 2	15	93 $\pm$ 4
	5	15	94 $\pm$ 3	15	97 $\pm$ 4
	6	15	92 $\pm$ 4	15	91 $\pm$ 4
	7	10	90 $\pm$ 3	9	90 $\pm$ 3
	8	9	99 $\pm$ 5	9	114 $\pm$ 3
	9	9	109 $\pm$ 5	10	108 $\pm$ 3
	10	9	81 $\pm$ 4	10	85 $\pm$ 5
	11	10	83 $\pm$ 4	9	103 $\pm$ 6
	12	10	94 $\pm$ 3	9	93 $\pm$ 5
	13	9	86 $\pm$ 2	9	97 $\pm$ 7

# Concentration of nitroguanidine in feed x mean feed consumption per day + body weight in kg.

\* Mean  $\pm$  Standard Error.

**Table 1 (cont.): Daily Consumption of Nitroguanidine#**

Group	Week	n	Males		n		
Females			(mg/kg/day)			(mg/kg/day)	
316 mg/kg/day	1	15	292*	±8	15	214	±7
	2	15	313	±10	15	331	±12
	3	14	299	±7	15	312	±15
	4	15	262	±9	15	300	±10
	5	15	292	±10	15	283	±16
	6	15	285	±12	15	300	±11
	7	10	317	±12	10	304	±24
	8	10	307	±17	9	305	±20
	9	9	364	±14	10	326	±15
	10	10	264	±8	9	269	±11
	11	10	287	±6	10	297	±11
	12	10	343	±22	9	296	±12
	13	9	286	±8	10	277	±14
1000 mg/kg/day	1	15	977	±43	14	714	±28
	2	15	964	±16	15	1211	±33
	3	14	947	±29	15	965	±26
	4	15	946	±16	15	959	±40
	5	15	959	±17	15	760	±18
	6	15	905	±38	15	1050	±35
	7	10	949	±16	10	981	±49
	8	10	938	±58	10	897	±87
	9	9	1178	±58	10	1169	±86
	10	10	887	±46	10	899	±69
	11	10	970	±35	10	980	±58
	12	10	931	±41	10	954	±49
	13	10	919	±26	10	1028	±52

# Concentration of nitroguanidine in feed x mean feed consumption per day + body weight in kg.

\* Mean ± Standard Error.

Table 2: Food Consumption

Group	Week	n	Males (g/week)	n	Females (g/week)
Controls	1	15	34* $\pm 1$	15	28 $\pm 1$
	2	14	36 $\pm 1$	15	33 $\pm 1$
	3	15	36 $\pm 1$	13	35 $\pm 1$
	4	15	35 $\pm 1$	15	35 $\pm 1$
	5	14	36 $\pm 1$	15	34 $\pm 1$
	6	15	35 $\pm 1$	15	36 $\pm 1$
	7	10	35 $\pm 1$	10	36 $\pm 1$
	8	10	34 $\pm 1$	10	33 $\pm 2$
	9	10	36 $\pm 1$	10	39 $\pm 2$
	10	10	36 $\pm 1$	7	37 $\pm 2$
	11	10	37 $\pm 1$	10	38 $\pm 1$
	12	10	35 $\pm 1$	10	37 $\pm 1$
	13	10	35 $\pm 1$	10	38 $\pm 1$
100 mg/kg/day	1	12	32 $\pm 1$	15	32 $\pm 2$
	2	14	35 $\pm 1$	15	36 $\pm 1$
	3	15	36 $\pm 1$	15	35 $\pm 1$
	4	14	35 $\pm 1$	15	36 $\pm 2$
	5	15	36 $\pm 1$	15	35 $\pm 1$
	6	15	33 $\pm 1$	15	35 $\pm 1$
	7	10	34 $\pm 1$	9	34 $\pm 1$
	8	9	35 $\pm 2$	9	37 $\pm 2$
	9	9	37 $\pm 2$	10	44 $\pm 3$
	10	9	37 $\pm 2$	10	36 $\pm 2$
	11	10	36 $\pm 2$	9	38 $\pm 1$
	12	10	36 $\pm 1$	9	39 $\pm 2$
	13	9	34 $\pm 1$	9	37 $\pm 2$

\* Mean  $\pm$  Standard Error.

**Table 2 (cont.): Food Consumption**

Group	Week	n	Males (g/week)	n	Females (g/week)
316 mg/kg/day	1	15	34* $\pm$ 1	15	30 $\pm$ 1
	2	15	35 $\pm$ 1	15	34 $\pm$ 1
	3	14	35 $\pm$ 1	15	36 $\pm$ 2
	4	15	35 $\pm$ 1	15	34 $\pm$ 1
	5	15	37 $\pm$ 1	15	33 $\pm$ 1
	6	15	34 $\pm$ 2	15	33 $\pm$ 1
	7	10	37 $\pm$ 2	10	34 $\pm$ 2
	8	10	34 $\pm$ 3	9	34 $\pm$ 2
	9	9	37 $\pm$ 1	10	36 $\pm$ 2
	10	10	37 $\pm$ 2	9	34 $\pm$ 2
	11	10	35 $\pm$ 1	10	36 $\pm$ 2
	12	10	37 $\pm$ 2	9	34 $\pm$ 2
	13	9	34 $\pm$ 1	10	34 $\pm$ 2
1000 mg/kg/day	1	15	33 $\pm$ 1	14	28 $\pm$ 1
	2	15	34 $\pm$ 1	15	35 $\pm$ 1
	3	14	35 $\pm$ 1	15	35 $\pm$ 1
	4	15	35 $\pm$ 1	15	35 $\pm$ 1
	5	15	35 $\pm$ 1	15	32 $\pm$ 1
	6	15	34 $\pm$ 2	15	34 $\pm$ 1
	7	10	36 $\pm$ 1	10	34 $\pm$ 1
	8	10	33 $\pm$ 2	10	33 $\pm$ 3
	9	9	39 $\pm$ 2	10	39 $\pm$ 3
	10	10	39 $\pm$ 2	10	37 $\pm$ 2
	11	10	38 $\pm$ 1	10	37 $\pm$ 2
	12	10	36 $\pm$ 1	10	35 $\pm$ 2
	13	10	35 $\pm$ 1	10	37 $\pm$ 2

\* Mean  $\pm$  Standard Error.

**Table 3: Water Consumption**

Group	Week	n	Males (ml/week)	n	Females (ml/week)
Controls	1	15	42* $\pm$ 2	15	37 $\pm$ 2
	2	14	45 $\pm$ 2	15	45 $\pm$ 2
	3	15	43 $\pm$ 2	15	45 $\pm$ 1
	4	15	45 $\pm$ 2	15	45 $\pm$ 1
	5	15	39 $\pm$ 2	15	43 $\pm$ 1
	6	13	40 $\pm$ 1	15	45 $\pm$ 1
	7	10	38 $\pm$ 2	10	46 $\pm$ 2
	8	10	35 $\pm$ 3	10	39 $\pm$ 4
	9	10	40 $\pm$ 2	10	45 $\pm$ 2
	10	10	42 $\pm$ 2	10	48 $\pm$ 3
	11	10	39 $\pm$ 2	10	48 $\pm$ 2
	12	10	40 $\pm$ 2	9	46 $\pm$ 2
	13	10	39 $\pm$ 2	8	44 $\pm$ 2
100 mg/kg/day	1	15	43 $\pm$ 1	15	35 $\pm$ 3
	2	14	44 $\pm$ 2	15	41 $\pm$ 2
	3	15	40 $\pm$ 1	15	39 $\pm$ 2
	4	15	39 $\pm$ 2	15	40 $\pm$ 2
	5	15	38 $\pm$ 1	15	39 $\pm$ 1
	6	14	35 <sup>@</sup> $\pm$ 1	14	39 $\pm$ 2
	7	10	36 $\pm$ 1	10	40 $\pm$ 2
	8	10	35 $\pm$ 2	9	38 $\pm$ 2
	9	10	36 $\pm$ 1	10	40 $\pm$ 2
	10	10	39 $\pm$ 2	10	42 $\pm$ 2
	11	10	35 $\pm$ 2	10	41 $\pm$ 2
	12	10	37 $\pm$ 1	10	43 $\pm$ 2
	13	10	34 $\pm$ 1	8	42 $\pm$ 3

\* Mean  $\pm$  Standard Error.<sup>@</sup> Value significantly different from control at  $p \leq 0.01$ .

Table 3 (cont.): Water Consumption

Group	Week	n	Males (ml/week)	n	Females (ml/week)
316 mg/kg/day	1	15	48* $\pm$ 2	15	40 $\pm$ 1
	2	15	50 $\pm$ 2	15	44 $\pm$ 2
	3	14	47 $\pm$ 3	15	42 $\pm$ 2
	4	15	46 $\pm$ 3	15	41 $\pm$ 2
	5	15	44 $\pm$ 2	15	40 $\pm$ 2
	6	13	40 $\pm$ 1	15	41 $\pm$ 2
	7	10	41 $\pm$ 2	10	40 $\pm$ 2
	8	9	40 $\pm$ 3	10	38 $\pm$ 2
	9	10	42 $\pm$ 2	10	40 $\pm$ 2
	10	10	43 $\pm$ 2	9	44 $\pm$ 4
	11	10	39 $\pm$ 2	10	43 $\pm$ 3
	12	10	40 $\pm$ 2	10	42 $\pm$ 2
	13	10	36 $\pm$ 2	10	43 $\pm$ 3
1000 mg/kg/day	1	15	55 <sup>e</sup> $\pm$ 2	15	43 $\pm$ 2
	2	15	57 <sup>e</sup> $\pm$ 2	15	55 <sup>e</sup> $\pm$ 2
	3	15	54 <sup>e</sup> $\pm$ 2	15	51 <sup>s</sup> $\pm$ 2
	4	15	52 $\pm$ 2	15	51 $\pm$ 2
	5	15	51 <sup>e</sup> $\pm$ 2	15	48 $\pm$ 2
	6	14	48 <sup>e</sup> $\pm$ 2	15	50 $\pm$ 2
	7	10	48 <sup>e</sup> $\pm$ 2	10	52 $\pm$ 3
	8	9	46 <sup>s</sup> $\pm$ 2	10	48 $\pm$ 2
	9	10	51 <sup>e</sup> $\pm$ 3	9	49 $\pm$ 2
	10	10	52 <sup>e</sup> $\pm$ 3	10	52 $\pm$ 3
	11	10	48 <sup>e</sup> $\pm$ 2	10	53 $\pm$ 3
	12	10	48 <sup>e</sup> $\pm$ 2	10	51 $\pm$ 2
	13	10	46 <sup>s</sup> $\pm$ 2	10	52 $\pm$ 3

\* Mean  $\pm$  Standard Error.<sup>s</sup> Value significantly different from control at  $p \leq 0.05$ .<sup>e</sup> Value significantly different from control at  $p \leq 0.01$ .



**Table 4: Body Weights**

Group	Week	n	Males (g)	n	Females (g)
Controls	1	15	33* $\pm 1$	15	26 $\pm < 0.5$
	2	15	34 $\pm 1$	15	26 $\pm < 0.5$
	3	15	34 $\pm 1$	15	26 $\pm < 0.5$
	4	15	36 $\pm 1$	15	28 $\pm < 0.5$
	5	15	37 $\pm 1$	15	28 $\pm < 0.5$
	6	15	38 $\pm 1$	15	28 $\pm < 0.5$
	7	10	40 $\pm 1$	10	28 $\pm 1$
	8	10	39 $\pm 1$	10	28 $\pm 1$
	9	10	39 $\pm 1$	10	29 $\pm 1$
	10	10	40 $\pm 1$	10	30 $\pm 1$
	11	10	41 $\pm 1$	10	30 $\pm 1$
	12	10	40 $\pm 1$	10	30 $\pm 1$
	13	10	41 $\pm 1$	10	30 $\pm 1$
100 mg/kg/day	1	15	31 $\pm 1$	15	26 $\pm < 0.5$
	2	15	32 $\pm 1$	15	26 $\pm < 0.5$
	3	15	33 $\pm 1$	15	26 $\pm < 0.5$
	4	15	34 $\pm 1$	15	27 $\pm 1$
	5	15	35 $\pm 1$	15	28 $\pm 1$
	6	15	36 $\pm 1$	15	28 $\pm 1$
	7	10	38 $\pm 1$	10	29 $\pm 1$
	8	10	37 $\pm 1$	10	28 $\pm 1$
	9	10	37 $\pm 1$	10	29 $\pm 1$
	10	10	38 $\pm 1$	10	29 $\pm 1$
	11	10	38 $\pm 1$	10	29 $\pm 1$
	12	10	38 $\pm 1$	10	30 $\pm 1$
	13	10	39 $\pm 1$	10	30 $\pm 1$

\* Mean  $\pm$  Standard Error.

Table 4 (cont.): Body Weights (g)

Group	Week	n	Males (g)	n	Females (g)
316 mg/kg/day	1	15	32* $\pm 1$	15	26 $\pm < 0.5$
	2	15	32 $\pm 1$	15	26 $\pm < 0.5$
	3	15	33 $\pm 1$	15	26 $\pm < 0.5$
	4	15	34 $\pm 1$	15	27 $\pm < 0.5$
	5	15	36 $\pm 1$	15	27 $\pm 1$
	6	15	36 $\pm 1$	15	27 $\pm < 0.5$
	7	10	38 $\pm 1$	10	28 $\pm < 0.5$
	8	10	36 $\pm 1$	10	28 $\pm < 0.5$
	9	10	38 $\pm 1$	10	28 $\pm < 0.5$
	10	10	39 $\pm 1$	10	29 $\pm < 0.5$
	11	10	39 $\pm 1$	10	29 $\pm < 0.5$
	12	10	39 $\pm 1$	10	29 $\pm < 0.5$
	13	10	39 $\pm 1$	10	30 $\pm < 0.5$
1000 mg/kg/day	1	15	31 $\pm 1$	15	25 $\pm < 0.5$
	2	15	32 $\pm 1$	15	25 $\pm < 0.5$
	3	15	33 $\pm 1$	15	26 $\pm < 0.5$
	4	15	35 $\pm 1$	15	27 $\pm < 0.5$
	5	15	36 $\pm 1$	15	27 $\pm < 0.5$
	6	15	36 $\pm 1$	15	27 $\pm < 0.5$
	7	10	39 $\pm 1$	10	26 $\pm 1$
	8	10	38 $\pm 1$	10	27 $\pm < 0.5$
	9	10	38 $\pm 1$	10	28 $\pm 1$
	10	10	39 $\pm 1$	10	28 $\pm 1$
	11	10	39 $\pm 1$	10	28 $\pm 1$
	12	10	38 $\pm 1$	10	28 $\pm 1$
	13	10	40 $\pm 1$	10	28 $\pm 1$

\* Mean  $\pm$  Standard Error.

Table 5: Clinical Observations\*

Sign	Dose Group (mg/kg/day)			
	Control	100	316	1000
Males				
Behavioral				
Irritable	9 (49)	6 (19)	9 (53)	6 (15)
Aggressive	5 (18)	3 (11)	4 (33)	1 (2)
Skin/Hair				
Alopecia	-	1 (2)	1 (1)	-
Swelling Jaw	-	-	-	1 (18)
Necrosis Tail	-	-	1 (21)	-
Ocular				
Corneal erosion, opacity, vascularization	1 (1)	-	-	2 (2)
Dilated pupil	-	1 (1)	-	-
Dehydration	-	-	1 (1)	1 (1)
Skeletal	-	-	-	1 (1)
Females				
Behavioral				
Irritable	12 (38)	6 (63)	13 (94)	11 (110)
Aggressive	1 (1)	1 (1)	1 (1)	3 (26)
Hyperactive	2 (2)	-	-	-
Chewing	3 (3)	-	1 (1)	-
Skin/Hair				
Alopecia	-	1 (20)	1 (17)	3 (6)
Scab	-	-	1 (7)	-
Ocular				
Corneal opacity, vascularization	-	2 (39)	1 (1)	1 (1)
Cataract	-	1 (1)	-	-
Conjunctivitis	-	1 (3)	-	-
Neurologic				
Twitching	-	-	-	1 (1)
Increased startle reflex	1 (1)	-	-	-
Dehydration	-	1 (2)	1 (1)	-

\* Data are presented as the number of animals exhibiting the sign with the total number of animal days the sign was observed, in parenthesis.

### Clinical Chemistry

A summary of the serum chemistry data is presented in Table 6. Individual clinical chemistry values, a key to parameter abbreviations, and the units of measurement are presented in Appendix K. The group-4 males had a significantly increased mean aspartate amino-transferase (AST) level compared to that of the controls ( $p \leq 0.05$ ) at interim sacrifice. The AST value was within normal limits compared to the baseline sacrifice performed at the beginning of the study period (Appendix Q). At terminal sacrifice, the group-3 males had significantly decreased uric acid levels compared to those of the controls ( $p \leq 0.05$ ). However, the uric acid level was within normal limits. The interim sacrifice groups-3 and -4 females had significantly increased albumin and albumin-globulin ratio values compared to those of the controls ( $p \leq 0.05$ ), but the values remained within the respective normal ranges established by the baseline sacrifice.

### Hematology

A summary of the hematology data is presented in Table 7. No statistically significant variances from the controls were found in either the male or female dose groups. Individual hematology values, a key to parameter abbreviations, and the units of measurement are presented in Appendix L. Baseline control data are presented in Appendix Q.

### Organ Weights and Ratios

Organ weights, organ-to-body weight ratios, and organ-to-brain weight ratios were compared for liver, spleen, kidneys, heart, testes/ovaries, and brain. The interim sacrifice group-4 males had a significantly greater brain-to-body weight ratio than the controls ( $p \leq 0.05$ ). The group-4 male animals in general had greater absolute brain weights and smaller body weights than the other groups, but these differences were not statistically significant ( $p \leq 0.05$ ). No statistically significant differences from the controls were observed in the organ weights or organ weight ratios in the female dose groups. The group mean organ weights and the comparative ratios are presented in Tables 8 through 10. Individual organ weight, organ-to-body weight ratio, and organ-to-brain weight ratio data are presented in Appendices M, N, and O, respectively. Baseline control data are presented in Appendix Q.

Table 6: Serum Chemistry

Group (mg/kg/day)	AST <sup>e</sup>	BUN	CK	ALB	BILI	CL	GLU	IRON	ALK	LDH	MAG
Interim Sacrifice Males											
Control	76.52* ±18.24 (5)	30.12 3.22 (5)	188.56 88.56 (5)	2.43 0.21 (5)	0.01 0.01 (3)	112.00 1.87 (5)	261.72 41.01 (5)	180.50 21.06 (4)	50.32 3.23 (5)	384.88 214.72 (5)	2.40 0.08 (5)
100	75.95 ±23.88 (4)	30.45 3.64 (4)	215.43 61.71 (4)	2.37 0.19 (4)	0.02 0.02 (2)	110.20 1.92 (5)	260.00 17.78 (4)	196.00 28.25 (4)	59.53 12.48 (4)	358.10 72.63 (4)	2.61 0.48 (4)
316	124.87 ±26.16 (3)	35.00 9.46 (3)	150.20 55.54 (3)	2.03 0.23 (3)	0.03 - (1)	110.25 2.99 (4)	213.40 67.70 (3)	150.00 43.84 (2)	31.03 17.57 (3)	495.60 68.13 (3)	2.60 0.22 (3)
1000	136.70* ±55.18 (5)	25.94 2.46 (5)	433.34 251.67 (5)	2.32 0.17 (5)	- - (0)	108.60 1.14 (5)	243.78 47.23 (5)	169.00 32.53 (2)	45.08 7.82 (5)	559.70 262.21 (5)	2.79 0.20 (5)

<sup>e</sup> Refer to Appendix K for explanation of abbreviations and units.

\* Values are presented as the group mean ± standard deviation with n in parenthesis.

\* Value is significantly different from the control at  $p \leq 0.05$  using the Dunnett's test.

Table 6 (cont.): Serum Chemistry

Group (mg/kg/day)	NA <sup>g</sup>	CAL	CHOL	CR	ALT	TP	URIC	K	TRIG	A-G
Interim Sacrifice Males										
Control	153.25 <sup>*</sup> ±2.22 (4)	8.40 0.34 (5)	76.73 30.19 (4)	0.52 0.05 (5)	43.98 9.72 (5)	4.72 0.16 (5)	1.34 0.32 (5)	5.63 0.85 (4)	118.00 41.26 (4)	1.07 0.17 (5)
100	154.60 ±0.55 (5)	8.15 0.96 (4)	79.78 15.33 (4)	0.59 0.14 (4)	40.88 9.66 (4)	4.55 0.06 (4)	1.63 0.43 (4)	6.22 1.02 (5)	133.75 53.99 (4)	1.08 0.15 (4)
316	156.00 ±2.83 (4)	8.27 0.55 (3)	45.85 2.05 (2)	0.58 0.05 (3)	33.23 12.56 (3)	4.67 0.83 (3)	1.87 0.29 (3)	5.98 0.51 (4)	143.00 41.01 (2)	0.86 0.36 (3)
1000	154.80 ±2.68 (5)	8.60 0.32 (5)	114.35 17.75 (2)	0.59 0.09 (5)	51.26 14.29 (5)	4.84 0.38 (5)	1.88 0.35 (5)	6.56 0.42 (5)	165.50 26.16 (2)	0.92 0.07 (5)

<sup>g</sup> Refer to Appendix K for explanation of abbreviations and units.

\* Values are presented as the group mean ± standard deviation with n in parenthesis.

Table 6 (cont.): Serum Chemistry

Group	AST <sup>e</sup>	BUN	CK	ALB	BILI	CL	GLU	IRON	ALK	LDH	MAG
(mg/kg/day)											
Terminal Sacrifice Males											
Control	139.63* ±76.70 (9)	30.21 7.84 (9)	145.80 62.95 (9)	2.87 0.25 (9)	0.03 0.02 (5)	111.11 2.89 (9)	235.37 42.78 (9)	209.00 5.72 (4)	51.27 18.69 (9)	387.11 129.58 (9)	2.50 0.24 (9)
100	125.20 ±78.23 (7)	27.81 8.86 (8)	185.84 179.02 (8)	2.80 0.25 (8)	0.04 0.04 (4)	110.00 2.06 (9)	269.26 27.80 (7)	245.50 23.06 (4)	43.76 12.94 (8)	345.85 167.88 (8)	2.37 0.18 (9)
316	116.63 ±36.01 (6)	25.58 6.66 (6)	117.85 89.39 (6)	2.75 0.10 (6)	0.05 0.01 (2)	109.67 1.73 (9)	270.15 52.42 (6)	193.00 - (1)	41.47 10.26 (6)	305.67 31.63 (6)	2.40 0.19 (9)
1000	128.93 ±67.44 (8)	24.76 7.90 (10)	123.25 70.16 (8)	2.82 0.24 (10)	0.04 0.05 (4)	110.00 1.05 (10)	282.51 45.84 (8)	249.00 120.46 (3)	46.13 16.12 (10)	384.66 106.83 (8)	2.51 0.28 (10)

<sup>e</sup> Refer to Appendix K for explanation of abbreviations and units.

. Values are presented as the group mean ± standard deviation with n in parenthesis.

Table 6 (cont.): Serum Chemistry

Group (mg/kg/day)	NA <sup>e</sup>	Terminal Sacrifice Males								K	TRIG	A-G
		CAL	CHOL	CR	ALT	TP	URIC					
Control	158.96*	8.98	95.39	0.46	53.03	4.96	2.25	6.98	133.63	1.39		
	±2.04 (9)	0.57 (9)	20.27 (8)	0.07 (9)	16.14 (9)	0.35 (9)	0.98 (6)	0.82 (9)	30.55 (8)	0.18 (9)		
100	157.60	8.70	81.00	0.43	43.75	4.74	2.20	6.29	104.17	1.49		
	±1.43 (9)	0.47 (9)	18.64 (6)	0.05 (8)	9.30 (8)	0.21 (8)	0.91 (6)	0.60 (9)	34.70 (6)	0.32 (8)		
316	158.70	8.99	108.40	0.52	50.40	4.92	1.00*	6.73	139.33	1.30		
	±1.53 (9)	0.42 (9)	32.49 (6)	0.10 (6)	23.33 (6)	0.17 (6)	0.50 (6)	1.54 (9)	38.77 (6)	0.19 (6)		
1000	158.35	9.07	96.03	0.45	40.00	4.95	1.48	6.76	134.50	1.37		
	±1.91 (10)	0.42 (10)	22.68 (6)	0.08 (10)	10.44 (10)	0.26 (10)	0.67 (6)	1.03 (10)	62.21 (6)	0.28 (10)		

<sup>e</sup> Refer to Appendix K for explanation of abbreviations and units.

\* Values are presented as the group mean ± standard deviation with n in parenthesis.

\* Value is significantly different from the control at  $p \leq 0.05$  using the Dunnett's test.



Table 6: Serum Chemistry

Group (mg/kg/day)	AST <sup>e</sup>	BUN	CK	ALB	BILI	CL	GLU	IRON	ALK	LDH	MAG
Interim Sacrifice Females											
Control	214.37* ±137.82 (3)	26.53 3.76 (3)	384.20 110.86 (3)	2.40 0.21 (3)	- - (0)	113.75 0.96 (4)	221.47 37.69 (3)	224.33 29.69 (3)	63.57 17.51 (3)	464.07 125.37 (3)	2.59 0.27 (3)
100	263.33 ±250.67 (3)	30.73 8.06 (4)	659.50 287.97 (3)	2.68 0.26 (4)	0.00 - (1)	113.00 1.41 (4)	214.13 22.34 (3)	209.00 39.60 (2)	69.48 15.10 (4)	579.80 204.51 (3)	2.44 0.47 (4)
316	323.90 ±298.16 (4)	23.45 7.35 (4)	1253.60 1620.52 (4)	2.88* 0.11 (4)	0.03 - (1)	112.75 0.96 (4)	219.43 14.67 (4)	182.25 44.21 (4)	91.75 18.12 (4)	668.93 382.19 (4)	2.65 0.17 (4)
1000	156.03 ±41.44 (4)	25.18 4.76 (5)	392.28 149.07 (4)	2.76* 0.15 (5)	0.02 - (1)	112.20 1.10 (5)	210.45 15.84 (4)	193.67 51.03 (3)	101.90 26.14 (5)	500.43 157.06 (4)	2.74 0.33 (5)

<sup>e</sup> Refer to Appendix K for explanation of abbreviations and units.

\* Values are presented as the group mean ± standard deviation with n in parenthesis.

\* Value is significantly different from the control at  $p \leq 0.05$  using the Dunnett's test.

Table 6 (cont.): Serum Chemistry

Group (mg/kg/day)	NA <sup>e</sup>	CAL	CHOL	CR	ALT	TP	URIC	K	TRIG	A-G
Interim Sacrifice Females										
Control	152.25* ±2.22 (4)	8.43 0.42 (3)	45.57 31.09 (3)	0.62 0.10 (3)	35.67 5.35 (3)	4.60 0.17 (3)	1.00 0.17 (3)	5.68 0.36 (4)	93.67 48.18 (3)	1.09 0.11 (3)
100	154.75 ±4.19 (4)	8.53 0.50 (4)	65.70 9.48 (2)	0.63 0.05 (4)	39.28 7.85 (4)	4.93 0.39 (4)	1.10 0.17 (3)	6.32 0.76 (4)	73.50 9.19 (2)	1.19 0.05 (4)
316	155.25 ±1.26 (4)	8.18 0.22 (4)	65.15 22.98 (4)	0.59 0.05 (4)	36.45 14.45 (4)	4.85 0.13 (4)	1.60 0.59 (4)	5.43 0.58 (4)	78.50 21.06 (4)	1.47* 0.19 (4)
1000	154.40 ±8.20 (5)	8.32 0.41 (5)	45.07 20.09 (3)	0.71 0.29 (5)	30.60 7.30 (5)	4.82 0.22 (5)	1.63 0.40 (4)	5.28 0.89 (5)	81.33 17.79 (3)	1.35* 0.10 (5)

<sup>e</sup> Refer to Appendix K for explanation of abbreviations and units.

\* Values are presented as the group mean ± standard deviation with n in parenthesis.

# Value is significantly different from the control at  $p \leq 0.01$  using the Dunnett's test.

\* Value is significantly different from the control at  $p \leq 0.05$  using the Dunnett's test.

Table 6 (cont.): Serum Chemistry

Group (mg/kg/day)	AST <sup>e</sup>	BUN	CK	ALB	BILI	CL	GLU	IRON	ALK	LDH	MAG
Terminal Sacrifice Females											
Control	96.52 <sup>*</sup> ±19.60 (5)	27.23 5.38 (8)	145.82 52.34 (5)	2.88 0.26 (5)	0.05 - (1)	114.13 2.42 (8)	269.50 4.59 (4)	255.00 - (1)	71.97 14.10 (8)	234.26 92.11 (5)	2.48 0.15 (9)
100	130.98 ±27.10 (4)	25.44 5.63 (5)	86.13 19.89 (4)	2.80 0.17 (5)	0.04 0.03 (4)	113.00 2.07 (8)	246.03 25.59 (4)	281.50 27.58 (2)	60.66 9.06 (5)	246.63 71.71 (4)	2.56 0.14 (9)
316	153.72 ±84.44 (5)	26.40 6.63 (7)	191.22 162.25 (5)	3.00 0.25 (5)	0.03 - (1)	114.44 2.74 (9)	253.46 36.44 (5)	285.00 - (1)	64.37 9.62 (7)	374.48 113.25 (5)	2.47 0.17 (10)
1000	- - (0)	22.50 ±3.22 (3)	- - (0)	3.00 - (1)	- - (0)	114.29 2.50 (7)	254.20 - (1)	- - (0)	73.72 8.49 (6)	- - (0)	2.49 0.27 (8)

<sup>e</sup> Refer to Appendix K for explanation of abbreviations and units.

\* Values are presented as the group mean ± standard deviation with n in parenthesis.

Table 6 (cont.): Serum Chemistry

Group (mg/kg/day)	NA <sup>e</sup>	CAL	CHOL	CR	ALT	TP	URIC	K	TRIG	A-G
Terminal Sacrifice Females										
Control	159.06 <sup>*</sup> ±2.40 (9)	8.92 0.41 (9)	55.58 15.51 (4)	0.55 0.17 (8)	44.89 20.08 (8)	4.80 0.10 (5)	0.88 0.21 (4)	5.66 0.58 (9)	82.25 10.14 (4)	1.52 0.32 (5)
100	157.09 ±2.78 (9)	9.02 0.44 (9)	54.58 10.36 (4)	0.64 0.34 (5)	41.08 10.86 (5)	4.86 0.18 (5)	2.63 1.68 (4)	5.74 0.69 (9)	121.25 54.71 (4)	1.36 0.17 (5)
316	159.90 ±1.96 (10)	9.22 0.42 (10)	38.45 8.70 (2)	0.69 0.40 (7)	43.89 21.93 (8)	5.08 0.35 (5)	1.27 0.85 (3)	6.22 1.05 (10)	107.50 37.48 (2)	1.44 0.11 (5)
1000	160.78 ±2.09 (8)	9.15 0.61 (8)	- - (0)	0.47 0.06 (3)	34.50 6.55 (6)	5.00 - (1)	- - (0)	5.61 0.69 (8)	- - (0)	1.50 - (1)

<sup>e</sup> Refer to Appendix K for explanation of abbreviations and units.

\* Values are presented as the group mean ± standard deviation with n in parenthesis.

Table 7: Hematology

Group	n	WBC <sup>e</sup>	RBC	HGB	HCT	MCV	MCH	MCHC
Interim Sacrifice Males								
Control	5	1.15 <sup>*</sup> ±0.41	7.898 1.347	13.60 2.729	38.02 7.840	47.6 1.52	17.20 0.561	35.90 0.660
100	5	1.15 ±0.07	8.492 1.100	14.72 1.906	40.46 5.377	47.4 1.14	17.42 0.403	36.50 0.557
316	5	2.58 ±3.03	6.590 1.132	11.72 2.028	32.96 5.172	48.2 2.17	17.24 0.706	35.50 1.046
1000	5	1.88 ±0.942	7.696 0.502	14.48 1.15	39.64 3.179	49.0 2.12	17.92 0.665	36.62 0.370

<sup>e</sup> Refer to Appendix L for explanation of abbreviations and units.  
 \* Values are presented as the group mean ± the standard deviation.

Table 7 (cont.): Hematology

Group (mg/kg/day)	n	RBC <sup>e</sup>	HGB	HCT	MCV	MCH	MCHC
Terminal Sacrifice Males							
Control	10	8.023 <sup>*</sup> ±0.9964	14.21 1.684	38.69 4.681	48.10 1.101	17.77 0.882	36.78 1.974
100	10	8.512 ±1.061	16.12 3.110	43.30 7.409	48.20 1.135	17.94 0.775	37.18 1.944
316	10	8.150 ±0.7566	14.00 1.467	38.95 3.557	47.70 0.949	17.25 0.834	35.94 1.389
1000	10	8.528 ±0.9443	15.03 1.880	41.10 4.455	48.20 1.033	17.62 0.555	36.50 1.002
Terminal Sacrifice Females							
Control	10	8.608 ±0.9769	15.35 2.071	42.22 5.344	48.80 1.135	17.75 0.546	36.29 0.657
100	10	8.584 ±1.183	15.88 2.549	43.21 6.756	48.70 0.949	17.99 0.412	36.75 0.440
316	10	8.622 ±0.7013	15.59 1.357	42.77 3.775	48.80 2.150	17.85 0.711	36.46 0.389
1000	10	9.022 ±0.9709	16.34 2.120	44.76 5.704	48.80 1.229	17.83 0.419	36.48 0.813

<sup>e</sup> Refer to Appendix L for explanation of abbreviations and units.  
<sup>\*</sup> Values are presented as the group mean ± the standard deviation.

Table 7 (cont.): Hematology

Group (mg/kg/day)	n	WBC <sup>e</sup> (1000's/ul)	SEG (#/ul)	LYM (#/ul)	ATL (#/ul)	MON (#/ul)	EOS (#/ul)	BAS (#/ul)
Terminal Sacrifice Males								
Control	10	1.51 <sup>*</sup> ±0.61	274.9 166.23	1236.2 594.32	0 0	0 0	0 0	0 0
100	10	2.64 ±1.12	696.0 517.56	1938.1 1069.64	0 0	0 0	2.7 8.54	0 0
316	10	2.35 ±1.69	184.6 88.61	2172.6 1693.75	0 0	0 0	0 0	0 0
1000	10	2.86 ±1.59	872.0 982.34	1983.6 760.83	0 0	0 0	0 0	0 0
Terminal Sacrifice Females								
Control	10	1.30 ±0.62	270 158.51	1030 477.83	0 0	0 0	0 0	0 0
100	10	1.54 ±0.62	290.8 137.41	1249.2 560.65	0 0	0 0	0 0	0 0
316	10	1.51 ±0.55	316.8 214.04	1193.2 468.36	0 0	0 0	0 0	0 0
1000	10	1.63 ±0.97	358.4 177.04	1274.9 815.64	0 0	0 0	0 0	0 0

<sup>e</sup> Refer to Appendix L for explanation of abbreviations.

\* Values are presented as the group mean ± the standard deviation.

Table 8: Organ Weights

Group <sup>s</sup>	Control		100		316		1000	
Day	45	90	45	90	45	90	45	90
n	5	10	5	10	5	10	5	10
Males								
Testes (g)	0.30*	0.28	0.28	0.31	0.26	0.27	0.28	0.49
	±0.03	0.02	0.02	0.04	0.03	0.04	0.03	0.59
Liver (g)	1.96	2.15	1.74	2.03	2.06	2.07	1.85	2.06
	±0.13	0.41	0.29	0.18	0.13	0.25	0.14	0.17
Heart (g)	0.19	0.22	0.18	0.21	0.20	0.19	0.20	0.19
	±0.03	0.04	0.03	0.03	0.02	0.06	0.02	0.02
Brain (g)	0.50	0.51	0.50	0.74	0.48	0.52	0.54	0.54
	±0.03	0.03	0.02	0.70	0.04	0.04	0.03	0.04
Spleen (mg)	0.11	0.11	0.10	0.11	0.15	0.11	0.10	0.12
	±0.02	0.02	0.01	0.02	0.14	0.02	0.02	0.05
Kidney (g)	0.55	0.65	0.54	0.62	0.48	0.63	0.50	0.57
	±0.08	0.10	0.08	0.09	0.03	0.07	0.06	0.17
Females								
Ovaries (mg)	0.11	0.04	0.03	0.04	0.05	0.04	0.04	0.03
	±0.16	0.02	0.02	0.01	0.01	0.02	0.01	0.02
Liver (g)	1.51	1.54	1.44	1.62	1.32	1.46	1.41	1.47
	±0.14	0.12	0.11	0.15	0.31	0.17	0.18	0.21
Heart (g)	0.16	0.15	0.16	0.15	0.13	0.15	0.15	0.16
	±0.03	0.02	0.02	0.03	0.04	0.03	0.02	0.03
Brain (g)	0.52	0.50	0.52	0.54	0.49	0.50	0.53	0.53
	±0.04	0.04	0.02	0.05	0.09	0.08	0.03	0.03
Spleen (mg)	0.11	0.12	0.10	0.10	0.12	0.10	0.12	0.24
	±0.01	0.02	0.02	0.03	0.03	0.03	0.02	0.42
Kidney (g)	0.37	0.42	0.37	0.40	0.37	0.39	0.31	0.38
	±0.02	0.05	0.02	0.05	0.02	0.05	0.08	0.03

<sup>s</sup> mg/kg/day.

\* Mean ± Standard Deviation.



Table 9: Organ-to-Body Weight Ratio

Group <sup>s</sup> Day n	Control		100		316		1000	
	45	90	45	90	45	90	45	90
	5	10	5	10	5	10	5	10
Males								
Liver (%)	5.28* ±0.30	5.18 0.68	4.91 1.05	5.24 0.25	5.77 0.38	5.24 0.40	5.58 0.46	5.21 0.50
Heart (%)	0.52 ±0.10	0.55 0.12	0.50 0.04	0.54 0.08	0.56 0.05	0.47 0.14	0.62 0.09	0.47 0.05
Brain (%)	1.36 ±0.13	1.24 0.12	1.40 0.18	1.88 1.68	1.34 0.18	1.33 0.20	1.62 <sup>e</sup> 0.13	1.36 0.11
Spleen (%)	0.30 ±0.05	0.26 0.03	0.30 0.05	0.29 0.05	0.43 0.40	0.27 0.06	0.31 0.06	0.31 0.13
Kidney (%)	1.49 ±0.24	1.57 0.13	1.50 0.14	1.60 0.14	1.33 0.11	1.60 0.15	1.49 0.11	1.43 0.41
Testes (%)	0.80 ±0.06	0.69 0.07	0.78 0.10	0.80 0.10	0.72 0.13	0.70 0.10	0.84 0.06	1.23 1.46
Females								
Liver (%)	5.30 ±0.36	5.13 0.44	5.14 0.27	5.53 0.72	4.82 0.65	4.96 0.57	5.10 0.42	5.21 0.76
Heart (%)	0.56 ±0.11	0.51 0.07	0.58 0.08	0.53 0.13	0.48 0.18	0.51 0.11	0.55 0.05	0.56 0.09
Brain (%)	1.82 ±0.13	1.68 0.25	1.84 0.06	1.84 0.24	1.79 0.31	1.71 0.26	1.94 0.11	1.89 0.14
Spleen (%)	0.38 ±0.04	0.39 0.08	0.36 0.06	0.35 0.10	0.43 0.06	0.33 0.10	0.43 0.09	0.89 1.54
Kidney (%)	1.31 ±0.06	1.38 0.18	1.32 0.04	1.37 0.24	1.38 0.19	1.31 0.16	1.13 0.32	1.33 0.14
Ovaries (%)	0.37 ±0.54	0.13 0.08	0.12 0.06	0.14 0.05	0.18 0.04	0.14 0.08	0.16 0.05	0.12 0.05

<sup>s</sup> mg/kg/day.

\* Mean ± Standard Deviation.

<sup>e</sup> Value significantly different from control at  $p \leq 0.05$ .

Table 10: Organ-to-Brain Weight Ratio

Group <sup>\$</sup> Day n	Control		100		316		1000	
	45	90	45	90	45	90	45	90
	5	10	5	10	5	10	5	10
Males								
Liver (%)	391* ±34	422 71	347 48	358 103	434 50	403 74	345 41	385 28
Heart (%)	37.9 ±4.4	44.7 9.1	36.0 7.2	37.6 12.2	42.4 7.0	37.0 2.2	38.1 6.3	35.0 4.2
Brain (%)	100 ±0	100 ±0	100 ±0	100 ±0	100 ±0	100 ±0	100 ±0	100 ±0
Spleen (%)	22.4 ±3.8	21.2 3.2	21.1 1.4	20.1 6.8	32.6 30.5	20.9 5.0	19.2 3.6	22.9 9.7
Kidney (%)	109 ±14	128 17	108 17	109 33	100 10	122 20	93 13	106 30
Testes (%)	59 ±6	56 5	55 5	56 18	54 3	53 7	52 5	92 114
Females								
Liver (%)	293 ±36	309 42	279 16	302 36	274 42	297 65	265 33	278 50
Heart (%)	30.3 ±4.2	30.3 3.5	31.5 4.3	28.6 6.6	26.2 6.3	30.5 7.5	28.4 2.4	29.7 5.4
Brain (%)	100 ±0	100 ±0	100 ±0	100 ±0	100 ±0	100 ±0	100 ±0	100 ±0
Spleen (%)	21.1 ±3.2	23.4 4.2	19.8 3.6	18.8 4.8	24.7 5.1	19.6 5.3	22.1 4.1	45.8 77.7
Kidney (%)	72 ±8	83 14	72 3	74 10	80 25	77 9	59 17	71 6
Ovaries (%)	20.2 ±28.9	8.0 4.4	6.2 3.0	7.5 2.5	10.2 3.0	8.0 4.2	8.1 2.3	6.5 2.8

<sup>\$</sup> mg/kg/day.

\* Mean ± Standard Deviation.

### Necropsy

No compound-related gross or microscopic lesions were observed. All gross and microscopic lesions were mild to minimal in severity and considered to be incidental findings commonly observed in aging mice. The 316 mg/kg/day female group had significantly decreased extramedullary hematopoiesis in the liver compared to the controls ( $p \leq 0.05$ ), but this was considered an incidental finding not related to dosing. The pathology report is presented in Appendix P.

### **DISCUSSION**

No clinical signs of toxicity attributable to nitroguanidine administration were observed during the 90-day study period. In addition, no mortalities or lesions were noted at necropsy or on microscopic examination that could be attributed to nitroguanidine administration. No consistent treatment-related changes were noted in food consumption, body weights, serum chemistry, hematology, or organ weights and weight ratios.

The lack of toxicity observed in this study is consistent with the results of previously reported studies of single-dose oral toxicity in mice (4), subacute toxicity in rats (7), and studies of 90-day subchronic toxicity in rats (8). Metabolism studies in rats (9) have indicated that nitroguanidine is rapidly absorbed following oral administration and is excreted in the urine over a dose range from 20 mg/kg to 200 mg/kg. Absorption and excretion were not measured at doses equivalent to the 1000 mg/kg/day administered in this study. However, the lack of toxicity observed in this study suggests that nitroguanidine might also be rapidly absorbed following oral administration and excreted in the urine at dose levels up to 1000 mg/kg/day.

Nitroguanidine may be acting as an osmotic diuretic in this study. Urea, a chemically related compound, has been used as an osmotic diuretic (10). Since nitroguanidine is considerably less soluble in water than guanidine or urea (11), the excretion of nitroguanidine in the urine would require considerably more urinary volume than would be required to excrete a similar quantity of guanidine or urea. The dose-related increases in water consumption following nitroguanidine administration observed in this study are consistent with an increased urinary volume requirement for excretion of nitroguanidine.

# **CONCLUSION**

Nitroguanidine, fed at dose levels from 100 mg/kg/day to 1000 mg/kg/day in the diet for 90 days, did not cause any appreciable toxicologic effects, other than increased water consumption in the high-dose group, under the conditions of this study.

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## Appendix A: CHEMICAL DATA

Chemical Name: Nitroguanidine (NGu)

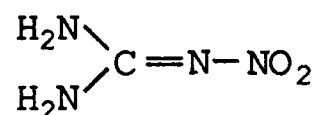
Other Listed Names: Guanidine, Nitro; alpha-Nitroguanidine;  
beta-Nitroguanidine

Chemical Abstracts Service Registry No.: 556-88-7

Lot Number: SOW85F011-028

LAIR Code: TP036B

Chemical Structure:



Molecular Formula: CH<sub>4</sub>N<sub>4</sub>O<sub>2</sub>

Molecular Weight: 104.1

Physical State: White powder

Melting Point: 232°C<sup>1</sup>

Purity: 99.7% (Data Sheet Attached)

Source: Hercules Aerospace Division  
Sunflower Ammunition Plant  
DeSoto, Kansas

Analytical Data:

The major peaks in the infrared spectrum of the compound were observed at 3450, 3396, 3342, 3278, 3201, 1666, 1634, 1525, 1404, 1314, 1151, 1045, 732 cm<sup>-1</sup>.<sup>2</sup> The spectrum was identical to the Sadtler standard spectrum for nitroguanidine.<sup>3</sup>

<sup>1</sup> Fedoroff BT, Sheffield OE. Encyclopedia of explosives and related items. Vol 6. Dover, NJ: Picatinny Arsenal, 1975: G154.

<sup>2</sup> Wheeler CR. Nitrocellulose-Nitroguanidine Projects. Laboratory Notebook #85-12-022, pp 22-23. Presidio of San Francisco, CA: Letterman Army Institute of Research.

<sup>3</sup> Sadtler Research Laboratory, Inc. Sadtler standard spectra. Philadelphia: The Sadtler Research Laboratory, Inc., 1962: Infrared spectrogram #21421.



**Appendix A (cont.): CHEMICAL DATA**

HPLC analysis showed only one peak (retention time, 4.8 min). The conditions employed were as follows: column, Brownlee RP-18 (4.6 x 250 mm); solvent, 10% methanol -90% water; flow rate, 0.7 ml/min; oven temperature, 50°C; monitoring wavelength, 265 nm.<sup>1</sup>

**Stability**

The concentrations of NGu in feed mixtures were determined by analyses performed approximately nineteen months after feed preparation. The results of these analyses are presented in the table below. These data indicate that NGu is stable in the feed for at least nineteen months.<sup>2</sup>

Target Concentration (mg NGu/g feed)	Date Prepared	Date Analyzed	Concentration Determined by Analysis (mg NGu/g feed)	% of Target
50	19 August 85	17 March 87	50.27	100.5
10.05	21 August 85	17 March 87	9.92	98.7
3.51	21 August 85	17 March 87	3.515	100.1
1.05	21 August 85	17 March 87	1.022	97.3

<sup>1</sup> Wheeler CR. Nitrocellulose-Nitroguanidine Projects. Laboratory Notebook #85-12-022, pp 24-25. Presidio of San Francisco, CA: Letterman Army Institute of Research.

<sup>2</sup> Wheeler CR. Nitrocellulose-Nitroguanidine Projects. Laboratory Notebook #85-12-022, pp 36-37. Presidio of San Francisco, CA: Letterman Army Institute of Research.

## Appendix A (cont.): CHEMICAL DATA

DESCRIPTION SHEET FOR EXPLOSIVES, CHEMICALS, ETC					FOR CONTROL, INHIBIT, EXEMPT, Para 7-2a AR 335-15		PAGE 1 OF 2					
TO: Commander US Army Armament Munitions and Chemical Command Attn: DRSNC-QAD Rock Island, ILL. 61299				FROM: Sunflower Army Ammunition Plant DeSoto, Kansas 66018		DATE June 26, 1985						
MANUFACTURER Hercules Aerospace Company				CONTRACT NO. DAAA09-76-C-4016 CLIN 0316		MATERIAL Nitroguanidine						
SECTION A - DESCRIPTION OF LOTS												
FROM NUMBER SOW85F011-028		THRU NUMBER --		TOTAL NO. LOTS 1		TOTAL NET AMOUNT ACCEPTED 10,950 pounds						
PLACE MANUFACTURED Sunflower Army Ammunition Plant				SPECIFICATION AND AMENDMENT/DRAWING NO. MIL-N-00494B dtd. 17 July 1984								
SECTION B - DESCRIPTION OF MATERIAL												
TEST REQUIREMENT--SHIFT AVERAGE												
				MAX→	- -	0.30%	7.0	0.06%	0.25%	0.20%	0.20%	6.0
				MIN→	99.00%	- -	4.5	- -	- -	- -	- -	3.4
LOT NO.	DATE	SHIFT	DRUMS	PURITY	ASH	pH	ACIDITY	TV	SULFATES	W.I.	FSSS	
SOW85F011-028	6-18-85	4-12	22-23	99.70	0.02	5.9	0.01	0.01	0.00	0.02	4.0	
-028			48-65									
-028			68									
-028	6-19-85	12-8	72	*	*	*	*	*	*	*	*	
-028			74-78									
-028			85-90									
-028			114-115									
-028			122-124									
-028			155-157									
-028			198-199									
-028	6-19-85	8-4	216-219	*	*	*	*	*	*	*	*	
-028			234-235									
-028			303-307									
-028			309-314									
-028			317-321									
-028	6-19-85	4-12	405	99.71	0.04	5.9	0.00	0.01	0.00	0.02	4.1	
-028	6-20-85	12-8	411-413	*	*	*	*	*	*	*	*	
REMARKS												
1) Packaging: Level C - Fiber drums per specification DOT21C60.												
2) Interfix number 011 identifies lots manufactured with Sunflower produced guanidine nitrate												
3) The average bulk density for Lot SOW85F011-028 is 0.262 gm/cc as determined by Method 201.3 of MIL-STD-650.												
SECTION C - CERTIFICATION												
SAMPLING CONDUCTED BY Hercules Aerospace Company				THE ABOVE MATERIAL COMPLIES WITH ALL SPECIFICATION REQUIREMENTS AND IS CERTIFIED TRUE AND CORRECT								
TESTING CONDUCTED BY Hercules Aerospace Company				June 1985 A. W. English, Quality Assurance Dept.								
THE ABOVE DESCRIBED LOTS ARE HEREBY ACCEPTED												
DATE 24 JUNE 1985				Chief, QA Division				FOR THE COMMANDER [Signature]				

## Appendix A (cont.): CHEMICAL DATA

DESCRIPTION SHEET FOR EXPLOSIVES, CHEMICALS, ETC DSAR-P-702-1091				ACR CONTROL SYMBOL EXEMPT-Para 7-2a AR 335-15		PAGE 20F 2					
TO: Commander US Army Ammunition Plant and Chemical Command Acct: DSAR-P-702-1091 Rock Island, ILL. 61299		FROM: Sunflower Army Ammunition Plant DeSoto, Kansas 66018		DATE June 26, 1985							
MANUFACTURER Hercules Aerospace Company		CONTRACT NO. DAAA09-76-C-4016		MATERIAL Nitroguanidine							
<b>SECTION A - DESCRIPTION OF LOTS</b>											
FROM NUMBER SOW85F011-028	THRU NUMBER --	TOTAL NO. LOTS 1	TOTAL NET AMOUNT ACCEPTED 10,950 pounds								
PLACE MANUFACTURED Sunflower Army Ammunition Plant			SPECIFICATION AND AMENDMENT/DRAWING NO. MIL-N-00494B dtd. 17 July 1984								
<b>SECTION B - DESCRIPTION OF MATERIAL</b>											
<b>TEST REQUIREMENT--SHIFT AVERAGE</b>											
		MAX→	--	0.30%	7.0	0.06%	0.25%	0.20%	0.20%	6.0%	
		MIN→	99.00%	--	4.5	--	--	--	--	3.4	
LOT NO.	DATE	SHIFT	DRUMS	PURITY	ASH	PH	ACIDITY	TV	SUL-FATES	W I.	FSSS
SOW85F011-028			415-534								
-028			537-548								
-028	6-20-85	8-4	557-566	*	*	*	*	*	*	*	*
-028			568-572								
-028			574-576								
TOTAL DRUMS			219								
<p>*Testing for requirement at reduced frequency per MIL-STD-1235A. Sampling and testing in accordance with MIL-N-00494B and MIL-STD-1235A. The test result reported is an average of shift samples on the date the lot was packed.</p> <p>REMARKS</p> <p>1) Packaging: Level C - Fiber drums per specification DOT21C60. 2) Interfix number 011 identifies lots manufactured with Sunflower produced guanidine nitrate 3) The average bulk density for Lot SOW85F011-028 is 0.262 gm/cc as determined by Method 201.3 of MIL-STD-650.</p>											
<b>SECTION C - CERTIFICATION</b>											
SAMPLING CONDUCTED BY Hercules Aerospace Company			THE ABOVE MATERIAL COMPLIES WITH ALL SPECIFICATION REQUIREMENTS AND IS CERTIFIED TRUE AND CORRECT.								
TESTING CONDUCTED BY Hercules Aerospace Company			22 June 1985 A. W. English, Quality Assurance Dept.								
THE ABOVE DESCRIBED LOTS ARE HEREBY ACCEPTED			FOR THE COMMANDER								
28 June 1985 DATE			Chief, QA Division TITLE			[Signature] SIGNATURE					

**Appendix B: ANIMAL DATA**

Species: *Mus musculus*

Strain: ICR

Source: Harlan Sprague Dawley, Inc.  
Indianapolis, Ind.

Sex: Male and female.

Date of birth: Male - 13 Feb 1987  
Female - 13 Feb 1987

Method of randomization: Weight bias, stratified animal  
allocation (TOXYS® Animal  
Allocation Program, SOP OP-ISG-24)

Animals in each group: 15 male and 15 female animals.  
10 each for baseline controls

Condition of animals at start of study: Normal

Body weight range at start of dosing: 22 - 36 g

Identification procedures: Tail tattoo procedure (SOP OP-  
ARG-1), numbers between (87C00020-  
87C00182) inclusive.

Pretest conditioning: Quarantine/acclimation from 18 March  
1987 - 1, 2 April 1987 males and  
females, respectively.

Justification: The laboratory mouse has proven to be a  
sensitive and reliable system for sub-  
chronic oral toxicity determination.

## Appendix C: ANALYSIS OF FEED MIXTURES

### INTRODUCTION

Feed mixtures containing nitroguanidine (NGu) were prepared to provide dose levels of nitroguanidine for laboratory rodents. The dose levels ranged from 100 to 1000 mg NGu/kg body weight per day. Differing food consumption rates and body weights required the preparation of separate diets for male and female mice. New diets were prepared each week to account for changes in body weight due to growth. The target concentrations of NGu in the feed mixtures ranged from 0.48 to 7.95 mg NGu per gram of diet. Samples of the feed mixtures were analyzed by HPLC to determine the concentration and homogeneity of NGu in the mixtures<sup>1</sup>. Methylnitroguanidine (MNGu) was used as an internal standard.

### MATERIALS

Nitroguanidine (Lot Nos. SOW85F011-028) was obtained from the Sunflower Army Ammunition Plant, Desoto, Kansas. Methylnitroguanidine was synthesized following the method of McKay<sup>2</sup> using 1-methyl-3-nitro-1-nitrosoguanidine (MMNG) 97%, and methylamine (40 wt % in water, Lot No. 0719AL) purchased from Aldrich Chemical Co., St. Louis, MO. The Rodent Chow<sup>®</sup> was ordered from Ralston Purina Co., St. Louis, MO. HPLC grade methanol was obtained from J. T. Baker Co., Phillipsburg, NJ. All water used in the assay was distilled and treated with UV light using an Organicpure<sup>®</sup> still (Sybron/Barnstead, Boston, MA).

### METHODS

Initially, stock solutions of NGu (1 mg/ml) and MNGu (1 mg/ml) in water were prepared. Standard solutions for the calibration plot were then prepared as dilutions to 25 ml with water of the stock solutions (Table 1). These standards were analyzed at the beginning and end of each run.

**Appendix C (cont.): ANALYSIS OF FEED MIXTURES**

Table 1: Preparation of Standard Solutions

Tube #	Target Conc. of NGu mg/ml	Target Conc. of MNGu mg/ml	Mls of NGu	Mls of MNGu
1	0.010	0.040	0.250	1.000
2	0.020	0.040	0.500	1.000
3	0.030	0.040	0.750	1.000
4	0.040	0.040	1.000	1.000
5	0.050	0.040	1.250	1.000
6	0.060	0.040	1.500	1.000
7	0.080	0.040	2.000	1.000

The standards prepared on 7 Dec 1987 were used throughout the analysis period from 8 Dec to 14 Dec. The stability of these solutions was verified by a stability study conducted during a 14-day oral subchronic toxicity study.<sup>3</sup> When not in use, the standard solutions were kept at 4°C in screw-cap volumetrics.

Samples from the feed mixtures and premix were extracted by adding varying amounts of water and the MNGu stock solution (1 ml/mg) as described in Table 2.

Table 2: Preparation of Feed Mixture Samples

Dose Level (mg/kg/day)	Gm of Diet Analyzed	Mls of MNGu Soln Added	Mls of Water Added	Total Volume (dil. factor)
100	1.00	1	24	25
316	1.00	4	96	100
1000	1.00	10	240	250
Premix (50 mg/g)	0.25	10	240	250

**Appendix C (cont.): ANALYSIS OF FEED MIXTURES**

The samples were stirred for one hour. The supernatant from each tube was filtered through a Swinney adaptor with a millipore filter (0.2  $\mu$ m). This filtrate was subsequently analyzed using a Hewlett-Packard 1090 HPLC system.

To determine the homogeneity of the feed mixtures, samples were taken from the right, left, and bottom ports of the Twin Shell Blender used in preparation of the diet and analyzed. Samples for testing homogeneity were collected during the first and eighth weeks of the study.

**HPLC PARAMETERS**

Column: Brownlee RP-18, Spheri 5 (250 x 4.6 mm)  
Guard Column: Brownlee New Guard RP-18, 7  $\mu$ m  
(15 x 3.2 mm)  
Mobile Phase: 10% Methanol:90% Water  
Flow Rate: 0.7 ml/min  
Wavelength: 265 nm, 550 nm (ref. wavelength)  
Injection Volume: 10  $\mu$ l  
Peak Width: 0.1 min  
Retention Time: 4.8 min

**CALCULATIONS**

The ratio of NGu to MNGU peak area was calculated for each of the standards and samples. Least squares linear regression analysis of the standard concentrations vs. the peak area ratios was performed to obtain a standard curve. The curve used was in the form of the best fitting line:  $y = mx + b$ , where  $y$  is the peak area ratio,  $m$  is the slope,  $x$  is the concentration of NGu and  $b$  is the y-intercept. The concentration of each extract was calculated by substituting for  $y$  the peak area ratio obtained from HPLC analysis and solving for  $x$ . All calculations were performed on a TI-55 scientific calculator. To calculate the concentration in the diet in terms of mg of NGu per gram of diet, the concentration of the extract was multiplied by the dilution factor and divided by the weight of the diet sample extracted. The experimental concentrations were compared to the target concentrations and reported as a percent of target.

**Appendix C (cont.): ANALYSIS OF FEED MIXTURES****RESULTS**

The plots of NGu concentration versus peak area ratio were linear within the range of concentrations analyzed. The results of the regression analysis for each run are shown in Table 3.

Table 3: Regression Analysis Values from Each Run

Date of Run	y-intercept	Slope	Correlation Coefficient
8 Dec 87	0.0120	28.12	0.99995
9 Dec 87	0.0115	27.90	0.99995
10 Dec 87	0.0119	27.90	0.99996
14 Dec 87	0.0126	27.91	0.99995
13 Sep 88	0.0046	28.74	0.99996

Under the conditions of the analysis, NGu eluted with a retention time of approximately 4.8 minutes, and MNGu eluted with a retention time of approximately 6.0 minutes. All samples (96) were analyzed within one week. Only one sample was extracted and analyzed from each batch of feed. The results from the analysis of diet mixtures are shown in Table 4.

Table 4: Analysis of Diet Mixtures

Target Concentration (mg NGu/g feed)	Date Prepared	Date Analyzed	Concentration Determined by Analysis (mg NGu/g feed)	% of Target
50.000	30 Mar 87	8 Dec 87	49.120	98.2
50.000	13 Apr 87	8 Dec 87	51.000	102.0



**Appendix C (cont.): ANALYSIS OF FEED MIXTURES**

Table 4 (cont.): Analysis of Diet Mixtures

Target Concentration (mg NGu/g feed)	Date Prepared	Date Analyzed	Concentration Determined by Analysis (mg NGu/g feed)	% of Target
6.467 (Right)	1 Apr 87	8 Dec 87	6.500	100.5
6.467 (Bottom)	1 Apr 87	8 Dec 87	6.460	99.9
6.467 (Left)	1 Apr 87	8 Dec 87	6.620	102.4
6.467 (Mean)	1 Apr 87	8 Dec 87	6.527	100.9
1.998 (Left)	1 Apr 87	8 Dec 87	1.896	94.9
1.998 (Right)	1 Apr 87	8 Dec 87	1.926	96.4
1.998 (Bottom)	1 Apr 87	8 Dec 87	1.898	95.0
1.998 (Mean)	1 Apr 87	8 Dec 87	1.907	95.4
0.670 (Right)	1 Apr 87	8 Dec 87	0.643	95.9
0.670 (Left)	1 Apr 87	8 Dec 87	0.663	98.9
0.670 (Bottom)	1 Apr 87	8 Dec 87	0.643	95.9
0.670 (Mean)	1 Apr 87	8 Dec 87	0.650	96.9
1.398	2 Apr 87	8 Dec 87	1.290	92.3
4.384	2 Apr 87	8 Dec 87	4.480	102.2
0.480	2 Apr 87	8 Dec 87	0.437	91.1
6.715	8 Apr 87	8 Dec 87	6.270	93.4
2.072	8 Apr 87	8 Dec 87	1.970	95.1
0.575	8 Apr 87	8 Dec 87	0.545	94.7
1.909	9 Apr 87	8 Dec 87	1.780	93.2
0.567	9 Apr 87	14 Dec 87	0.580	102.2

**Appendix C (cont.): ANALYSIS OF FEED MIXTURES**

Table 4 (cont.): Analysis of Diet Mixtures

Target Concentration (mg NGu/g feed)	Date Prepared	Date Analyzed	Concentration Determined by Analysis (mg NGu/g feed)	% of Target
6.242	9 Apr 87	8 Dec 87	6.070	97.2
6.512	15 Apr 87	8 Dec 87	6.341	97.4
1.992	15 Apr 87	8 Dec 87	1.942	97.5
0.598	15 Apr 87	8 Dec 87	0.558	93.3
5.015	16 Apr 87	8 Dec 87	4.979	99.3
1.705	16 Apr 87	8 Dec 87	1.605	94.2
0.508	16 Apr 87	8 Dec 87	0.483	95.1
6.671	22 Apr 87	8 Dec 87	6.622	99.3
1.947	22 Apr 87	8 Dec 87	1.783	91.6
0.626	22 Apr 87	8 Dec 87	0.576	92.0
0.531	23 Apr 87	8 Dec 87	0.493	92.8
1.627	23 Apr 87	9 Dec 87	1.643	101.0
5.170	23 Apr 87	9 Dec 87	5.034	97.4
7.000	29 Apr 87	9 Dec 87	6.751	96.4
2.150	29 Apr 87	14 Dec 87	1.980	92.1
0.695	29 Apr 87	9 Dec 87	0.650	93.6
1.728	30 Apr 87	9 Dec 87	1.597	92.4
5.263	30 Apr 87	9 Dec 87	4.880	92.7
0.534	30 Apr 87	14 Dec 87	0.535	100.2
50.000	4 May 87	9 Dec 87	48.200	96.4

**Appendix C (cont.): ANALYSIS OF FEED MIXTURES**

Table 4 (cont.): Analysis of Diet Mixtures

Target Concentration (mg NGu/g feed)	Date Prepared	Date Analyzed	Concentration Determined by Analysis (mg NGu/g feed)	% of Target
0.690	6 May 87	14 Dec 87	0.713	103.3
2.144	6 May 87	14 Dec 87	2.113	98.6
7.053	6 May 87	9 Dec 87	6.680	94.7
0.556	7 May 87	9 Dec 87	0.513	92.3
1.849	7 May 87	9 Dec 87	1.738	94.0
5.900	7 May 87	9 Dec 87	5.805	98.4
7.213	13 May 87	9 Dec 87	7.292	101.1
2.307	13 May 87	14 Dec 87	2.330	101.0
0.770	13 May 87	9 Dec 87	0.693	90.0
0.569	14 May 87	9 Dec 87	0.538	94.5
5.442	14 May 87	9 Dec 87	5.231	96.1
1.893	14 May 87	9 Dec 87	1.760	93.0
50.000	19 May 87	14 Dec 87	51.200	102.4
0.768 (Left)	20 May 87	9 Dec 87	0.750	97.7
0.768 (Right)	20 May 87	9 Dec 87	0.705	91.9
0.768 (Bottom)	20 May 87	9 Dec 87	0.760	99.0
0.768 (Mean)	20 May 87	9 Dec 87	0.738	96.2
2.321 (Left)	20 May 87	14 Dec 87	2.327	100.7
2.321 (Right)	20 May 87	14 Dec 87	2.405	103.6
2.321 (Bottom)	20 May 87	14 Dec 87	2.291	98.7

**Appendix C (cont.): ANALYSIS OF FEED MIXTURES**

Table 4 (cont.): Analysis of Diet Mixtures

Target Concentration (mg NGu/g feed)	Date Prepared	Date Analyzed	Concentration Determined by Analysis (mg NGu/g feed)	% of Target
2.321 (Mean)	20 May 87	14 Dec 87	2.341	101.0
7.688 (Bottom)	20 May 87	9 Dec 87	7.453	96.9
7.688 (Right)	20 May 87	10 Dec 87	7.639	99.4
7.688 (Left)	20 May 87	10 Dec 87	7.406	96.3
7.688 (Mean)	20 May 87	10 Dec 87	7.499	97.5
0.601	21 May 87	14 Dec 87	0.613	102.0
1.831	21 May 87	14 Dec 87	1.768	96.5
5.372	21 May 87	10 Dec 87	5.108	95.1
7.952	27 May 87	10 Dec 87	7.811	98.2
2.383	27 May 87	10 Dec 87	2.541	106.6
0.745	27 May 87	13 Sep 88	0.773	103.7
1.839	28 May 87	14 Dec 87	1.808	98.3
0.502	28 May 87	14 Dec 87	0.495	98.6
5.735	28 May 87	10 Dec 87	5.757	100.4
0.648	3 Jun 87	10 Dec 87	0.583	90.0
2.069	3 Jun 87	10 Dec 87	1.915	92.6
6.455	3 Jun 87	10 Jun 87	6.151	95.3
0.462	4 Jun 87	14 Dec 87	0.470	101.6
1.754	4 Jun 87	10 Dec 87	1.620	92.4
4.941	4 Jun 87	10 Dec 87	4.757	96.3

**Appendix C (cont.): ANALYSIS OF FEED MIXTURES****Table 4 (cont.): Analysis of Diet Mixtures**

Target Concentration (mg NGu/g feed)	Date Prepared	Date Analyzed	Concentration Determined by Analysis (mg NGu/g feed)	% of Target
50.00	9 Jun 87	10 Dec 87	49.000	98.0
0.650	10 Jun 87	10 Dec 87	0.615	94.6
2.289	10 Jun 87	14 Dec 87	2.241	97.9
6.964	10 Jun 87	10 Dec 87	6.962	100.0
5.326	11 Jun 87	10 Dec 87	5.191	97.5
1.754	11 Jun 87	10 Dec 87	1.685	96.1
0.555	11 Jun 87	14 Dec 87	0.535	96.4
7.186	17 Jun 87	10 Dec 87	6.901	96.0
2.473	17 Jun 87	14 Dec 87	2.542	102.8
0.743	17 Jun 87	10 Dec 87	0.700	94.2
5.316	18 Jun 87	10 Dec 87	5.349	100.6
1.791	18 Jun 87	14 Dec 87	1.765	98.6
0.521	18 Jun 87	10 Dec 87	0.490	94.0
7.425	24 Jun 87	10 Dec 87	7.284	98.1
2.344	24 Jun 87	14 Dec 87	2.316	98.8
0.743	24 Jun 87	10 Dec 87	0.693	93.3
5.608	25 Jun 87	10 Dec 87	5.460	97.4
1.752	25 Jun 87	10 Dec 87	1.705	97.3
0.604	25 Jun 87	10 Dec 87	0.545	90.3

**Appendix C (cont.): ANALYSIS OF FEED MIXTURES**

Results of the homogeneity study are shown in Table 5.

Table 5: Homogeneity of Mixtures

Target Conc of NGu (mg/g)	Site of Sampling	Conc Detn <sup>o</sup> by Analysis (mg/g)	Mean Conc (mg/g)	Absolute Dev. from Mean (%)
Week 1				
0.670	Right	0.643	0.650	1.0
	Left	0.663		2.1
	Bottom	0.643		1.0
1.999	Right	1.926	1.907	1.0
	Left	1.896		0.6
	Bottom	1.898		0.5
6.467	Right	6.500	6.527	0.4
	Left	6.620		1.4
	Bottom	6.460		1.0
Week 8				
0.768	Right	0.705	0.738	4.5
	Left	0.750		1.6
	Bottom	0.760		2.9
2.321	Right	2.327	2.341	0.6
	Left	2.405		2.7
	Bottom	2.291		2.1
7.688	Right	7.639	7.499	1.9
	Left	7.406		1.2
	Bottom	7.453		0.6

<sup>o</sup>Detn = Determination.

**DISCUSSION**

The concentration of NGu in the diet mixtures was within 10% of the target concentration. Samples collected during the first and eighth weeks of the study showed that the NGu concentration was homogeneous in the feed over the range tested, according to the EPA criteria for homogeneity.<sup>4</sup> Table 6 contains the summary of target values.

## Appendix C (cont.): ANALYSIS OF FEED MIXTURES

Table 6: Range of % of Target Values

WEEK	MALE	FEMALE
1	95.0- 102.4	91.1-102.2
2	93.4- 95.1	93.2-102.2
3	93.3- 97.5	94.2- 99.3
4	91.6- 99.3	92.8-101.0
5	92.1- 96.4	91.1-100.2
6	94.7-103.3	92.3- 98.4
7	90.0-101.1	93.0- 96.1
8	91.9-103.6	95.1-102.0
9	98.2-106.6	98.3-100.4
10	90.0- 95.3	92.4-101.6
11	94.6-100.0	96.1- 97.5
12	94.2-102.8	94.0-100.6
13	93.3- 98.8	90.3- 97.4

## REFERENCES

1. Wheeler C, Dahlberg E, Ryabik J, Korte DW. Quantitation of Nitroguanidine in Podent Chow. Toxicology Series 228. Presidio of San Francisco, CA: Letterman Army Institute of Research. January, 1988, Laboratory Note No. 88-72.
2. McKay AF, inventor; Honorary Advisory Council for Scientific and Industrial Research, Ottawa, assignee. 1-substituted-3-nitroguanidines. Can. patent 519,488. 1955 Dec 13. In: Chemical Abstracts, 1956; 50: 12107.
3. Morgan EW, Brown LD, Lewis CM, Dahlgren RR, Korte DW. Fourteen-Day Subchronic Oral Toxicity Study of Nitroguanidine in Rats. Toxicology Series 146. Presidio of San Francisco, CA: Letterman Army Institute of Research. June, 1988, Institute Report No. 272.
4. EPA, GLP Standards, Final Rule (40 CFR part 792) as published in the Federal Register, 29 Nov 1983, Vol. 48, No. 230, pp. 53931-53933.

**Appendix D: HISTORICAL LISTING OF STUDY EVENTS**

<u>Date</u>	<u>Event</u>
18 March 87	Animals arrived at LAIR. They were sexed, observed for illness, weighed, and caged in the GLP Suite.
19 Mar-1 Apr 87	Animals were checked daily.
23 Mar 87	Animals were tail tattooed.
25,26 Mar 87	Animals were weighed, males and females respectively, and food and water consumption monitored (feeders and water bottles weighed)
30 Mar, 11 May 29 Jun 87	Eyes were examined and initial, interim, and terminal sacrifices were performed.
1 April 87	Animals were removed from quarantine, males were weighed, dietary concentrations were calculated, and diet containing test compound was started. Ten baseline control males were submitted for necropsy, hematology, and serology.
1 April- 2 July 87	Observations were conducted twice daily.
2 April 87	Females were weighed, dietary concentrations were calculated, and diet containing test compound was started. Ten baseline control females were submitted for necropsy, hematology, and serology.
8,15,22,29 Apr, 6,13,20,27 May 3,10,17,24 Jun 1987	Males were observed and weighed, and water bottles and feeders were weighed. Diet requirements were prepared and feeders were changed to new mix.
9,16,23,30 Apr 7,14,21,28 May 4,11,18,25 Jun 1987	Females were observed and weighed, and water bottles and feeders were weighed. Diet requirements were recalculated and new feed mixes were prepared. Feeders were changed to new mix.
13,14 May 87	Five males and 5 females per group were submitted for necropsy, hematology, and serology.



**Appendix D (cont.): HISTORICAL LISTING OF STUDY  
EVENTS**

1,2 July 87

Males and females, respectively, were observed, weighed, and submitted for necropsy. Blood and tissue samples were taken for the measurements specified.

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## **Appendix E: HEMATOLOGY/CLINICAL CHEMISTRY INDICES**

The following are LAIR GLP SOPs for the Hematology measurements performed during the study:

1. Complete Blood Count - OP-PSG-40 (WBC, RBC, HGB, HCT, MCV, MCH, and MCHC).
2. WBC Differential - OP-PSG-26 (neutrophils, lymphocytes, eosinophils, and monocytes)

Counts for the neutrophils, lymphocytes, eosinophils, and monocytes are obtained by multiplying the WBC by the appropriate percentage obtained from the differential count.

The following are LAIR GLP SOPs for the Clinical Chemistry measurements performed during the study:

1. Calcium - OP-ACH-76
2. Sodium and Potassium - SOP being written; measurements performed in accordance with COBAS FARA™ Operator Manual 44351, software version 8650
3. Chloride - OP-ACH-79
4. Magnesium - OP-ACH-77
5. Phosphorus - OP-ACH-73
6. Glucose - OP-ACH-66
7. Cholesterol - OP-ACH-69
8. Triglycerides - OP-ACH-68
9. Creatinine - OP-ACH-75
10. Blood Urea Nitrogen - OP-ACH-64
11. Uric Acid - OP-ACH-70
12. Albumin - OP-ACH-74
13. Total Protein - OP-ACH-72
14. Total Bilirubin - OP-ACH-78
15. Serum Iron - OP-ACH-80
16. Aspartate Amino-Transferase - OP-ACH-61
17. Alanine Amino-Transferase - OP-ACH-63
18. Lactate Dehydrogenase - OP-ACH-62
19. Creatine Phosphokinase - OP-ACH-65
20. Alkaline Phosphatase - OP-ACH-67

Globulin values were calculated by subtracting the albumin values from the total protein values.

## Appendix F: NITROGUANIDINE CONSUMPTION (mg/kg/day)

## Group 1 Males

Animal#	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-													
021	0	0	0	0	0	0	0	0	0	0	0	0	0
026	0	0	0	0	0	0	0	0	0	0	0	0	0
032	0	0	0	0	0	0	0	0	0	0	0	0	0
037*	0	0	0	0	0	0	0	0	0	0	0	0	0
038	0	0	0	0	0	0	0	0	0	0	0	0	0
041*	0	0	0	0	0	0	0	0	0	0	0	0	0
045	0	0	0	0	0	0	0	0	0	0	0	0	0
066	0	0	0	0	0	0	0	0	0	0	0	0	0
075	0	0	0	0	0	0	0	0	0	0	0	0	0
077*	0	0	0	0	0	0	0	0	0	0	0	0	0
079*	0	0	0	0	0	0	0	0	0	0	0	0	0
080*	0	0	0	0	0	0	0	0	0	0	0	0	0
082	0	0	0	0	0	0	0	0	0	0	0	0	0
083	0	0	0	0	0	0	0	0	0	0	0	0	0
093	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean	0	0	0	0	0	0	0	0	0	0	0	0	0
Std Dev	0	0	0	0	0	0	0	0	0	0	0	0	0
SEM	0	0	0	0	0	0	0	0	0	0	0	0	0

\* Interim sacrifice animal.

## Appendix F (cont.): NITROGUANIDINE CONSUMPTION (mg/kg/day)

## Group 2 Males

Animal#	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-													
020*	99	83	•	88	96	96	93	90	110	•	75	89	82
030	125	104	111	85	90	120	113	126	•	106	97	119	•
031	•	95	106	102	130	119	83	117	143	79	104	97	96
034	90	83	66	82	108	83	91	96	107	79	83	94	88
036	105	80	85	82	87	90	81	94	98	68	67	78	78
040	87	80	77	78	83	77	80	91	104	79	75	94	91
056	80	80	82	80	90	96	80	82	99	77	77	93	87
063	90	73	73	78	83	74	94	82	•	76	78	88	86
065	109	87	84	89	93	78	87	•	102	90	90	95	83
071*	96	76	75	73	85	80	91	91	104	79	82	95	85
081	•	90	101	92	98	96	92	105	110	90	82	95	85
085	•	101	91	85	103	97	92	•	•	•	•	•	•
088*	90	88	87	82	93	90	92	•	•	•	•	•	•
090*	87	82	84	76	93	104	92	•	•	•	•	•	•
098*	79	72	71	74	81	86	91	91	104	90	90	95	83

Mean	95	85	85	83	94	92	90	99	109	81	83	94	86
Std Dev	13	9	13	8	12	14	9	14	14	11	11	10	5
SEM	4	2	4	2	3	4	3	5	5	4	4	3	2

\* Interim sacrifice animal.

• Unable to calculate due to incomplete food consumption data.

## Appendix F (cont.): NITROGUANIDINE CONSUMPTION (mg/kg/day)

## Group 3 Males

Animal#	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-													
024	318	318	303	270	291	293	284	325	384	266	292	353	311
033*	289	246	302	333	393	198							
039*	257	290	262	220	254	226							
042	290	334	338	271	299	320	323	344	373	274	311	363	312
044	273	265	252	207	239	241	293	263	292	221	253	233	262
049*	265	358	336	277	299	392							
050*	358	301	314	263	309	284							
051	322	313	317	248	268	309	317	359	390	280	290	347	271
052	309	345	•	320	322	310	333	325	382	287	297	329	331
055	229	263	269	232	259	268	308	186	412	229	270	314	279
059*	282	320	296	263	266	275			•	294	290	389	276
078	312	322	331	269	305	342	325	359	•	294	290	320	497
084	309	354	296	300	323	293	412	295	394	288	320	497	•
094	300	375	286	224	315	267	305	325	314	252	270	294	261
096	264	291	269	239	241	250	268	287	333	251	278	315	271
Mean	292	313	299	262	292	285	317	307	364	264	287	343	286
Std Dev	32	37	27	36	40	48	39	53	41	25	20	69	25
SEM	8	10	7	9	10	12	12	17	14	8	6	22	8

\* Interim sacrifice animal.

• Unable to calculate due to incomplete food consumption data.

## Appendix F (cont.): NITROGUANIDINE CONSUMPTION (mg/kg/day)

## Group 4 Males

Animal#	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-													
025*	999	926	935	885	904	839							
027	1414	980	991	831	937	901	982	1012	1168	854	881	845	954
046*	997	927	996	976	1115	805							
047	991	1004	959	946	886	851	959	930	1075	811	867	906	934
048	933	948	986	972	939	832	940	552	1403	834	860	830	858
054*	965	1045	1139	1123	1025	1041							
057	848	923	932	972	964	903	938	907	1105	1081	1047	1036	989
058	803	896	•	921	940	907	893	947	•	858	1042	890	991
061	851	948	906	946	964	903	962	989	1076	793	922	914	1041
062	845	924	852	946	912	696	908	840	1042	811	1073	908	774
067*	904	843	906	892	860	800							
072*	967	962	647	946	932	800							
073	1306	1069	962	946	1021	1309	901	980	1523	1220	1188	1260	928
092	904	1031	1009	920	1018	1083	1068	1297	1194	813	895	834	832
095	933	1031	1035	971	964	904	938	930	1018	791	922	887	888
Mean	977	964	947	946	959	905	949	938	1178	887	970	931	919
Std Dev	168	62	110	63	65	147	50	182	173	145	111	130	81
SEM	43	16	29	16	17	38	16	58	58	46	35	41	26

\* Interim sacrifice animal.

• Unable to calculate due to incomplete food consumption data.

## Appendix F (cont.): NITROGUANIDINE CONSUMPTION (mg/kg/day)

## Group 1 Females

Animal#	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-													
114	0	0	0	0	0	0	0	0	0	0	0	0	0
116	0	0	0	0	0	0	0	0	0	0	0	0	0
117	0	0	0	0	0	0	0	0	0	0	0	0	0
126*	0	0	0	0	0	0							
129	0	0	0	0	0	0	0	0	0	0	0	0	0
130*	0	0	0	0	0	0							
135	0	0	0	0	0	0	0	0	0	0	0	0	0
140	0	0	0	0	0	0	0	0	0	0	0	0	0
145	0	0	0	0	0	0	0	0	0	0	0	0	0
151*	0	0	0	0	0	0							
153*	0	0	0	0	0	0							
161*	0	0	0	0	0	0							
165	0	0	0	0	0	0	0	0	0	0	0	0	0
168	0	0	0	0	0	0	0	0	0	0	0	0	0
178	0	0	0	0	0	0	0	0	0	0	0	0	0
Mean	0	0	0	0	0	0	0	0	0	0	0	0	0
Std Dev	0	0	0	0	0	0	0	0	0	0	0	0	0
SEM	0	0	0	0	0	0	0	0	0	0	0	0	0

\* Interim sacrifice animal.



**Appendix F (cont.): NITROGUANIDINE CONSUMPTION (mg/kg/day)**  
**Group 2 Females**

Animal#	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-													
099*	65	97	96	73	76	63	•	•	139	84	103	87	106
101	101	118	127	110	105	90	69	88	66	63	82	•	78
111	96	95	71	85	84	78	91	110	95	85	96	103	102
121	108	108	87	87	103	98	102	147	104	99	112	109	•
124	88	133	99	133	96	93	85	117	103	114	113	108	89
134	114	123	97	104	112	101	91	118	101	72	112	83	120
143	62	124	93	83	94	73	89	123	98	69	•	70	75
144	58	98	84	75	82	81	89	123	98	69	•	70	75
146*	82	132	101	101	105	102	84	123	93	73	81	77	83
155	60	92	74	77	79	76	102	110	122	91	99	87	83
158	82	139	97	101	99	99	84	123	93	73	81	77	83
169*	65	113	80	86	106	86	102	110	122	91	99	87	83
171*	58	89	87	88	91	99	84	123	93	73	81	77	83
175*	74	110	80	73	85	109	84	123	93	73	81	77	83
176	39	148	98	113	136	119	95	95	161	103	135	118	138
Mean	77	115	91	93	97	91	90	114	108	85	103	93	97
Std Dev	21	18	14	17	15	15	10	17	26	17	17	16	21
SEM	6	5	4	4	4	4	3	6	8	5	6	5	7

\* Interim sacrifice animal.

• Unable to calculate due to incomplete food consumption data.

## Appendix F (cont.): NITROGUANIDINE CONSUMPTION (mg/kg/day)

## Group 3 Females

Animal#	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-													
105	170	284	291	302	261	284	224	397	341	270	357	296	251
109*	211	288	290	297	266	303							
112*	243	387	449	348	279	325							
118	206	284	331	322	244	257	277	296	321	262	287	313	291
122	184	275	229	235	219	248	251	253	249	223	268	270	226
125*	205	320	282	261	262	294							
132*	251	392	358	298	333	411							
150	199	333	284	261	279	306	484	334	314	271	294	306	313
152	198	292	221	251	212	231	251	183	267	231	249	226	211
160	198	320	331	356	285	319	277	•	330	•	282	•	292
162*	208	339	289	296	278	268							
163	220	407	314	313	304	301	321	287	374	269	313	325	282
167	255	362	344	348	479	301	363	337	378	287	337	328	369
173	206	298	368	268	246	315	279	321	297	273	257	261	252
181	251	391	291	339	304	340	314	334	387	335	324	336	286
Mean	214	331	312	300	283	300	304	305	326	269	297	296	277
Std Dev	26	46	56	38	63	43	75	61	47	32	35	37	45
SEM	7	12	15	10	16	11	24	20	15	11	11	12	14

\* Interim sacrifice animal.

• Unable to calculate due to incomplete food consumption data.

## Appendix F (cont.): NITROGUANIDINE CONSUMPTION (mg/kg/day)

## Group 4 Females

Animal#	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-													
107*	717	1214	875	852	735	1021							
120	931	1395	1206	1313	•	1426	1365	1216	1771	1490	1394	1302	1271
127*	845	1249	910	879	711	983							
128	845	1214	996	996	837	995	920	1022	975	831	934	906	953
139	667	1156	882	857	763	1116	927	1010	1349	881	961	934	1040
148*	717	1124	1016	950	777	1029							
149	640	1192	978	921	794	989	891	846	1012	810	851	911	924
154	768	1283	975	1053	869	1087	934	956	1061	874	1038	949	1170
156	640	1001	930	879	686	952	1040	252	911	745	840	764	805
157	819	1401	985	1134	788	1044	996	1016	1194	883	921	917	1006
164*	614	1134	967	852	823	1044							
166*	665	1413	1016	1053	709	972							
174	614	1214	817	745	663	944	825	704	881	726	793	817	780
180	589	1006	821	774	640	889	854	782	1151	801	879	911	1170
182	•	1167	1094	1130	846	1259	1057	1162	1390	947	1187	1134	1157
Mean	719	1211	965	959	760	1050	981	897	1169	899	980	954	1028
Std Dev	106	126	101	154	71	135	154	276	273	218	184	155	165
SEM	28	33	26	40	18	35	49	87	86	69	58	49	52

\* Interim sacrifice animal.

• Unable to calculate due to incomplete food consumption data.

## Appendix G: FOOD CONSUMPTION (g/week)

## Group 1 Males

Animal#	Base	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-														
021	28	26	26	28	28	29	27	25	28	30	29	31	29	29
026	35	35	36	37	36	SP	35	34	35	36	33	35	33	33
032	38	40	39	40	39	39	39	36	40	37	39	41	40	38
037*	28	26	29	30	39	37	31							
038	33	44	33	39	31	43	35	35	35	34	36	37	33	34
041*	29	34	38	37	35	37	36							
045	36	31	41	32	29	31	30	31	28	34	32	33	32	30
066	34	35	38	38	38	35	36	37	33	37	38	38	34	35
075	37	38	43	43	41	40	44	40	29	42	41	41	42	39
077*	32	31	SP	35	34	29	33							
079*	34	31	33	35	35	34	34							
080*	53	27	34	38	35	34	30							
082	32	37	40	39	36	34	36	36	41	42	37	36	35	35
083	34	30	36	38	36	36	36	35	36	35	39	39	38	37
093	36	40	39	38	40	39	37	36	34	36	39	40	38	39
Mean	35	34	36	36	35	36	35	35	34	36	36	37	35	35
Std Dev	6	5	5	4	4	4	4	4	5	4	4	3	4	4
SEM	2	1	1	1	1	1	1	1	1	1	1	1	1	1

\* Interim sacrifice animal.  
SP = spill

## Appendix G (cont.): FOOD CONSUMPTION (g/week)

## Group 2 Males

Animal#	Base	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-														
020*	31	30	31	SP	33	33	31	32	29	34	SP	30	31	29
030	37	39	40	43	34	32	39	41	43	SP	46	41	44	SP
031	31	SP	39	44	42	49	41	41	41	SP	48	45	37	38
034	27	32	35	28	35	42	30	31	41	48	35	45	37	38
036	31	34	31	34	33	31	30	32	32	34	33	34	34	32
040	32	30	34	33	33	32	28	31	34	33	31	29	29	30
056	33	25	31	32	31	33	33	30	31	33	33	30	34	33
063	35	33	32	32	34	33	26	38	31	35	37	34	37	36
065	35	40	39	38	40	38	29	36	SP	38	39	38	38	39
071*	34	34	33	33	32	34	30	34	31	34	40	37	35	32
081	36	SP	38	43	39	37	34	37	40	41	40	40	40	37
085	35	SP	44	40	38	42	38	37	31	34	40	40	40	37
088*	30	30	35	36	33	35	31							
090*	34	32	37	38	37	40	42							
098*	25	24	26	26	27	27	27							
Mean	32	32	35	36	35	36	33	34	35	37	37	36	36	34
Std Dev	3	5	5	6	4	6	5	4	5	5	5	5	4	4
SEM	1	1	1	1	1	1	1	1	2	2	2	2	1	1

\* Interim sacrifice animal.

SP = spill

## Appendix G (cont.): FOOD CONSUMPTION (g/week)

## Group 3 Males

Animal#	Base	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-														
024	36	35	35	35	35	35	33	29	33	36	34	31	34	32
033*	28	35	28	37	47	50	23							
039*	33	32	35	33	32	35	30							
042	32	33	38	39	34	36	36	34	36	36	36	35	35	34
044	34	34	32	35	30	33	32	37	33	33	34	34	27	34
049*	33	32	42	40	38	38	48							
050*	36	38	31	34	32	35	31							
051	48	39	40	40	37	37	41	41	44	44	44	38	42	36
052	42	34	38	SP	44	41	37	38	36	40	43	38	38	42
055	28	26	29	32	31	32	32	37	15	42	31	32	32	32
059*	30	30	33	32	33	31	31							
078	45	40	40	43	38	41	43	40	44	SP	44	38	45	35
084	35	34	39	32	40	40	34	47	30	38	39	36	52	SP
094	29	33	40	32	29	39	31	33	35	32	35	32	30	30
096	29	30	32	31	31	29	29	29	30	33	34	33	33	32
Mean	35	34	35	35	35	37	34	37	34	37	37	35	37	34
Std Dev	6	4	4	4	5	5	6	6	8	4	5	3	8	3
SEM	2	1	1	1	1	1	2	2	3	1	2	1	2	1

\* Interim sacrifice animal.

SP = spill

## Appendix G (cont.): FOOD CONSUMPTION (g/week)

## Group 4 Males

Animal#	Base	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-														
025*	30	30	31	32	29	30	29	33	34	35	34	31	30	33
027	33	47	35	35	29	34	34	33						
046*	31	31	30	33	33	37	27	35	33	36	36	34	34	35
047	34	34	37	36	36	34	33	37	17	47	37	32	32	33
048	42	34	36	37	38	37	34	36						
054*	35	30	35	39	38	34	36	36	33	38	48	40	41	38
057	39	30	34	36	38	37	35	36	38	SP	41	44	37	40
058	34	31	35	SP	37	39	36	36	36	37	37	38	38	42
061	33	31	36	36	37	39	35	36	29	34	36	41	35	29
062	32	29	33	32	36	35	27	34						
067*	31	31	32	34	33	33	31							
072*	30	28	29	20	29	29	26	32	32	47	50	43	46	33
073	28	42	37	34	33	36	48	41	46	40	37	36	33	32
092	37	31	38	39	35	38	42	36	33	35	36	38	36	35
095	43	33	38	40	39	38	36							
Mean	34	33	34	35	35	35	34	36	33	39	39	38	36	35
Std Dev	4	5	3	5	3	3	6	2	7	5	5	4	5	4
SEM	1	1	1	1	1	1	2	1	2	2	2	1	1	1

\* Interim sacrifice animal.

SP = spill

## Appendix G (cont.): FOOD CONSUMPTION (g/week)

## Group 1 Females

Animal#	Base	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-														
114	48	34	33	46	37	34	37	36	37	41	36	38	37	36
116	SP	28	33	37	35	33	36	37	36	36	35	38	37	37
117	40	26	31	SP	39	32	39	35	31	39	39	40	34	34
126*	32	25	33	35	34	42	32	32						
129	SP	37	41	38	42	28	43	35	43	47	SP	40	41	44
130*	30	29	36	40	39	36	38							
135	30	26	31	31	29	31	37	34	25	40	SP	34	39	38
140	28	23	31	32	32	31	35	34	31	33	SP	38	34	35
145	52	28	30	34	35	35	37	34	20	37	34	37	39	34
151*	32	29	38	33	36	39	37							
153*	27	26	28	29	29	38	29							
161*	46	25	28	29	30	29	27							
165	28	26	32	37	39	35	36	37	33	34	33	31	33	34
168	SP	28	36	SP	36	33	36	40	38	39	39	42	42	41
178	28	30	33	33	38	31	35	41	38	45	46	38	37	42
Mean	36	28	33	35	35	34	36	36	33	39	37	38	37	38
Std Dev	9	4	4	5	4	4	4	2	7	4	4	3	3	4
SEM	3	1	1	1	1	1	1	1	2	1	2	1	1	1

\* Interim sacrifice animal.

SP = spill



## Appendix G (cont.): FOOD CONSUMPTION (g/week)

## Group 2 Females

Animal#	Base	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-														
099*	24	23	27	32	26	27	25	SP	SP	55	35	39	36	38
101	31	42	37	48	42	37	33	28	30	29	29	32	SP	31
111	27	43	31	30	36	33	33	32	34	39	34	35	41	38
121	40	45	34	34	31	39	40	36	47	41	40	41	45	SP
124	SP	34	40	36	51	34	33	31	36	38	46	40	43	32
134	30	44	37	35	40	38	36	33	35	37	29	41	32	43
143	38	24	36	35	32	32	26	33	42	43	32	SP	31	32
144	SP	25	33	34	33	32	33	36	45	42	35	33	35	35
146*	44	34	43	38	43	40	39	35	39	55	42	40	41	34
155	31	27	31	31	33	31	31	40	39	55	42	40	41	34
158	SP	37	47	38	40	39	39	35	39	55	42	40	41	34
169*	29	26	34	29	33	39	33	35	39	55	42	40	41	34
171*	29	25	28	34	35	32	38	35	39	55	42	40	41	34
175*	45	31	36	30	28	30	40	32	39	55	42	40	41	34
176	SP	15	41	34	37	41	39	32	27	57	40	44	44	46
Mean	33	32	36	35	36	35	35	34	37	44	36	38	39	37
Std Dev	7	9	5	5	6	4	5	4	7	9	6	4	5	5
SEM	2	2	1	1	2	1	1	1	2	3	2	1	2	2

\* Interim sacrifice animal.

SP = spill

## Appendix G (cont.): FOOD CONSUMPTION (g/week)

## Group 3 Females

Animal#	Base	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-														
105	25	23	29	33	36	32	32	25	44	37	35	43	34	32
109*	32	32	34	38	38	35	39							
112*	SP	33	38	49	40	33	34							
118	29	29	29	39	37	31	29	32	34	36	34	37	36	37
122	23	25	27	25	25	24	26	26	27	26	26	29	30	25
125*	30	30	34	32	30	31	32							
132*	44	34	37	39	33	38	43							
150	50	27	34	31	30	33	32	52	37	34	34	33	34	36
152	29	29	31	26	30	27	26	29	21	31	29	30	26	26
160	36	28	34	39	41	35	36	32	SP	37	SP	34	SP	36
162*	26	26	32	29	29	28	27							
163	29	31	40	37	36	36	34	37	33	42	36	39	40	37
167	SP	36	37	42	40	42	34	39	36	41	36	42	39	47
173	31	29	34	45	32	27	33	30	33	31	33	31	30	30
181	SP	34	40	33	39	36	37	35	37	42	42	39	40	34
Mean	32	30	34	36	34	33	33	34	34	36	34	36	34	34
Std Dev	8	4	4	7	5	5	5	8	7	5	5	5	5	6
SEM	2	1	1	2	1	1	1	2	2	2	2	2	2	2

\* Interim sacrifice animal.

SP = spill

## Appendix G (cont.): FOOD CONSUMPTION (g/week)

## Group 4 Females

Animal#	Base	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-														
107*	32	28	35	32	32	31	32	42	45	56	57	47	46	44
120	SP	32	37	39	42	SP	43							
127*	34	33	36	32	33	30	32							
128	51	33	35	35	36	34	30	32	35	32	33	34	32	33
139	29	25	32	31	31	31	35	31	36	41	35	35	33	36
148*	37	28	35	40	37	34	36							
149	27	24	33	33	32	31	31	31	29	32	31	31	31	32
154	40	30	37	37	41	38	38	35	38	40	36	42	36	42
156	34	25	30	34	33	30	31	32	10	31	34	34	30	32
157	43	32	42	36	41	32	34	36	39	45	39	36	36	40
164*	54	24	34	34	32	36	34							
166*	52	27	44	40	41	31	34							
174	28	24	35	31	29	29	33	32	27	30	31	31	31	29
180	30	23	29	30	28	28	30	32	30	35	33	32	31	39
182	SP	SP	35	40	44	37	41	41	43	49	39	48	46	43
Mean	38	28	35	35	35	32	34	34	33	39	37	37	35	37
Std Dev	10	4	4	4	5	3	4	4	10	9	8	6	6	5
SEM	3	1	1	1	1	1	1	1	3	3	2	2	2	2

\* Interim sacrifice animal.

SP = spill

## Appendix H: WATER CONSUMPTION (ml/week)

## Group 1 Males

Animal#	Base	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-														
021	13	30	32	33	32	31	SP	27	27	33	33	31	32	32
026	45	46	45	43	41	37	42	37	38	35	37	38	33	34
032	53	55	55	48	49	45	43	38	44	36	42	40	42	39
037*	35	37	44	39	62	38	40							
038	51	49	47	42	49	40	38	36	39	36	37	36	40	35
041*	36	42	37	33	35	30	SP							
045	46	44	43	41	40	51	41	37	25	37	38	34	36	34
066	39	38	47	45	44	39	38	39	40	40	43	42	39	40
075	49	44	50	47	42	39	43	37	25	39	44	41	37	37
077*	46	41	48	44	42	36	41							
079*	35	22	34	36	36	34	34							
080*	50	44	46	46	41	36	35							
082	44	43	SP	47	51	42	45	46	21	59	53	31	51	48
083	55	52	55	52	55	47	45	42	49	43	52	50	47	48
093	50	49	46	51	50	45	41	42	38	39	44	42	40	41
Mean	43	42	45	43	45	39	40	38	35	40	42	39	40	39
Std Dev	11	8	7	6	8	6	3	5	9	7	6	6	6	6
SEM	3	2	2	2	2	2	1	2	3	2	2	2	2	2

\* Interim sacrifice animal.

SP = spill

## Appendix H (cont.): WATER CONSUMPTION (ml/week)

## Group 2 Males

Animal#	Base	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-														
020*	36	37	41	38	38	38	36							
030	46	46	53	46	46	42	SP	42	43	40	44	33	37	33
031	31	37	41	42	38	36	36	38	34	34	36	33	37	33
034	35	34	35	29	31	30	30	31	29	32	32	31	33	29
036	36	42	41	39	28	36	31	34	36	33	35	32	34	32
040	44	38	40	39	36	35	36	37	33	35	37	32	37	35
056	37	39	37	34	33	32	33	30	30	32	33	32	36	30
063	42	48	42	38	39	38	30	39	36	36	38	37	40	37
065	49	48	48	46	47	42	35	37	38	39	44	41	41	41
071*	43	45	47	44	42	42	37							
081	37	42	45	44	41	36	33	33	20	34	40	30	31	28
085	38	46	47	40	48	46	40	40	46	44	49	45	43	38
088*	40	46	52	47	41	41	35							
090*	48	55	58	38	51	48	45							
098*	30	37	39	34	33	33	30							
Mean	39	43	44	40	39	38	35	36	35	36	39	35	37	34
Std Dev	6	6	6	5	7	5	4	4	7	4	5	5	4	4
SEM	1	1	2	1	2	1	1	1	2	1	2	2	1	1

\* Interim sacrifice animal.

SP = spill

## Appendix H (cont.): WATER CONSUMPTION (ml/week)

## Group 3 Males

Animal#	Base	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-														
024	60	68	68	SP	64	61	SP	50	58	55	55	52	55	50
033*	54	57	59	76	74	63	41							
039*	45	41	44	28	39	41	38							
042	43	50	53	50	50	48	44	43	42	41	45	43	42	38
044	41	41	39	40	36	35	SP	36	40	35	37	36	35	33
049*	42	43	46	50	47	46	40							
050*	20	42	41	45	41	38	40							
051	52	58	67	58	55	50	51	48	40	47	51	42	49	37
052	45	47	51	50	46	46	38	41	38	41	43	39	37	38
055	31	37	43	39	37	36	39	38	SP	48	37	32	33	31
059*	43	45	53	49	42	40	39							
078	41	47	45	45	40	39	39	37	40	37	37	37	36	31
084	38	44	43	39	40	41	37	41	26	37	43	40	40	33
094	45	44	46	4	37	39	35	38	36	38	42	36	34	35
096	46	49	48	42	42	39	37	35	44	39	43	37	37	38
Mean	43	48	50	47	46	44	40	41	40	42	43	39	40	36
Std Dev	9	8	9	11	11	8	4	5	8	6	6	5	7	6
SEM	2	2	2	3	3	2	1	2	3	2	2	2	2	2

\* Interim sacrifice animal.

SP = spill

## Appendix H (cont.): WATER CONSUMPTION (ml/week)

## Group 4 Males

Animal#	Base	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-														
025*	45	50	50	50	48	45	43							
027	49	58	59	57	52	52	52	47	47	47	47	43	41	42
046*	54	46	42	41	43	40	SP							
047	44	61	59	57	54	40	46	46	47	47	48	45	45	46
048	65	78	83	74	70	71	64	66	SP	76	74	61	56	59
054*	27	51	52	53	50	47	43							
057	48	54	60	56	55	54	50	48	49	51	50	48	50	45
058	46	54	58	58	46	56	55	45	47	53	57	57	55	57
061	33	60	64	58	59	60	54	56	54	56	55	53	52	37
062	46	48	52	51	52	50	43	42	40	46	47	44	46	41
067*	46	51	55	52	50	49	44							
072*	38	47	44	47	44	43	39							
073	38	43	52	48	45	43	44	40	40	40	47	42	45	45
092	47	55	58	51	51	51	45	45	47	42	45	40	43	36
095	56	68	66	63	61	57	49	48	39	51	52	49	42	48
Mean	45	55	57	54	52	51	48	48	46	51	52	48	48	46
Std Dev	9	9	10	8	7	8	7	8	5	10	9	7	5	8
SEM	2	2	3	2	2	2	2	2	2	3	3	2	2	2

\* Interim sacrifice animal.

SP = spill

## Appendix H (cont.): WATER CONSUMPTION (ml/week)

## Group 1 Females

Animal#	Base	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-														
114	41	36	38	40	44	40	42	38	37	40	40	44	38	39
116	42	37	46	44	45	43	45	44	43	44	47	SP	42	43
117	39	34	40	46	46	44	47	41	39	41	SP	47	41	41
126*	36	28	39	41	41	38	41							
129	67	58	64	56	56	55	57	57	57	60	62	61	59	59
130*	40	40	44	47	46	47	49							
135	41	34	38	40	39	40	39	41	11	51	52	SP	52	44
140	33	30	43	41	43	41	43	47	38	37	40	44	41	41
145	46	35	45	44	47	44	46	46	40	44	44	50	49	43
151*	44	41	51	51	54	50	51							
153*	37	46	39	39	41	36	38							
161*	40	36	42	44	40	41	37							
165	28	32	43	47	44	43	43	43	37	39	43	43	45	34
168	36	34	46	48	45	41	43	44	38	40	46	42	44	43
178	45	40	50	47	46	44	50	55	54	49	58	51	53	49
Mean	41	37	45	45	45	43	45	46	39	45	48	48	46	44
Std Dev	9	7	7	5	5	5	5	6	12	7	8	6	7	7
SEM	2	2	2	1	1	1	1	2	4	2	3	2	2	2

\* Interim sacrifice animal.

SP = spill



**Appendix H (cont.): WATER CONSUMPTION (ml/week)**  
**Group 2 Females**

Animal#	Base	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-														
099*	28	26	30	28	30	32	SP	46	44	47	48	46	42	31
101	49	44	53	52	50	47	50	32	SP	31	36	32	33	SP
111	34	35	36	36	38	35	36	32	42	43	42	41	45	47
121	40	38	45	41	44	48	47	39	35	37	37	37	37	SP
124	32	34	41	35	41	36	39	37	35	53	51	51	49	55
176	SP	47	57	52	52	47	48	43	42	42	45	50	51	36
134	39	13	44	43	46	42	44	40	37	35	38	38	52	51
143	33	30	40	45	40	42	38	43	36	35	38	35	33	33
144	35	29	38	37	33	36	33	34	32	35	34	35		
146*	41	40	44	42	43	42	40							
155	37	31	36	35	35	31	35	36	33	35	37	34	36	34
158	44	41	48	45	45	44	44	45	44	46	50	47	49	46
169*	30	27	31	33	38	36	33							
171*	32	60	29	34	33	34	31							
175*	35	33	39	34	35	35	33							
Mean	36	35	41	39	40	39	39	40	38	40	42	41	43	42
Std Dev	6	11	8	7	6	6	6	5	5	7	6	7	7	9
SEM	2	3	2	2	2	1	2	2	2	2	2	2	2	3

\* Interim sacrifice animal.  
SP = spill

## Appendix H (cont.): WATER CONSUMPTION (ml/week)

## Group 3 Females

Animal#	Base	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-														
105	32	34	37	37	39	36	36	29	32	35	38	32	34	62
109*	35	38	46	42	40	37	42							
112*	40	40	44	43	45	40	40							
118	35	36	40	45	43	39	40	41	38	40	40	43	42	43
122	28	30	34	31	29	28	32	31	30	29	34	32	37	28
125*	41	40	45	39	38	34	43							
132*	51	50	51	50	48	54	49							
150	40	41	49	42	42	42	45	51	46	38	46	48	48	56
152	34	34	35	31	35	30	30	32	34	35	35	32	35	32
160	27	34	41	43	40	41	39	36	40	42	SP	44	40	40
162*	30	42	47	41	40	38	39							
163	38	40	49	48	45	42	42	43	38	42	48	49	49	47
167	41	44	45	44	20	45	40	40	36	42	41	43	39	37
173	42	44	47	42	49	43	46	44	42	43	45	42	40	40
181	40	48	56	51	55	52	55	50	41	53	69	60	57	44
Mean	37	40	44	42	41	40	41	40	38	40	44	43	42	43
Std Dev	6	6	6	6	8	7	6	8	5	6	11	9	7	10
SEM	2	1	2	2	2	2	2	2	2	2	4	3	2	3

\* Interim sacrifice animal.

SP = spill

## Appendix H (cont.): WATER CONSUMPTION (ml/week)

## Group 4 Females

Animal#	Base	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-														
107*	40	37	57	47	48	42	45		39	SP	65	69	61	65
120	49	53	69	62	65	62	68	65						
127*	39	34	51	49	53	52	55							
128	43	49	56	51	54	48	46	45	45	43	44	46	46	45
139	36	37	48	44	43	43	45	53	47	47	46	50	44	46
148*	40	41	52	45	46	41	46							
149	49	60	61	63	51	56	54	53	54	53	58	52	52	53
154	45	50	61	59	60	54	55	50	55	56	54	62	54	63
156	50	46	51	49	50	46	49	51	50	53	60	56	51	55
157	SP	50	62	57	54	51	57	53	55	57	60	57	58	59
164*	33	39	50	49	46	52	46							
166*	46	45	57	58	55	49	51							
174	31	30	41	40	39	39	42	39	39	37	37	36	39	35
180	42	39	50	47	51	44	49	63	52	54	56	57	52	55
182	45	42	52	48	51	41	45	44	39	44	43	46	49	46

Mean	42	43	55	51	51	48	50	52	48	49	52	53	51	52
Std Dev	6	8	7	7	6	7	7	8	7	7	9	9	7	9
SEM	2	2	2	2	2	2	2	3	2	2	3	3	2	3

\* Interim sacrifice animal.

SP = spill

## Appendix I: BODY WEIGHTS (g)

## Group 1 Males

Animal#	Rcpt#	Day 0	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-															
021	19	29	27	27	28	30	31	31	31	32	32	31	32	32	33
026	20	30	31	32	32	34	36	37	37	38	38	38	40	40	40
032	22	33	36	37	38	40	41	44	42	44	42	43	45	46	46
037*	20	28	28	29	31	32	33	34	41	40	39	40	41	41	42
038	21	32	33	34	35	33	37	38	41	40	39	40	41	41	42
041*	23	32	34	34	34	36	37	38	40	38	37	38	38	37	39
045	21	31	33	34	34	36	37	38	40	38	37	38	38	37	39
066	22	31	31	33	34	34	35	35	36	36	35	36	36	35	35
075	22	36	36	37	38	39	40	41	44	42	43	45	46	45	47
077*	21	34	33	35	35	36	36	37							
079*	21	31	32	33	33	35	36	39							
080*	22	33	35	35	35	37	37	38							
082	20	33	33	35	34	37	38	38	40	38	39	41	39	39	40
083	22	34	33	34	34	37	37	39	41	40	41	43	43	45	44
093	18	32	33	36	37	39	40	42	43	42	42	43	45	44	47
Mean	21	32	33	34	34	36	37	38	40	39	39	40	41	40	41
Std Dev	1	2	3	3	3	3	3	3	4	3	3	4	4	5	5
SEM	<0.5	1	1	1	1	1	1	1	1	1	1	1	1	1	2

@ Receipt.

\* Interim sacrifice animal.

## Appendix I (cont.): BODY WEIGHTS (g)

## Group 2 Males

Animal#	Rcpt#	Day	0	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-																
020*	19	29	28	29	29	31	31	32	33	34	34	34	35	35	35	35
030	19	28	29	30	30	31	33	33	33	36	36	36	36	37	37	37
031	21	29	30	32	32	33	34	35	35	37	37	37	37	38	38	39
034	19	32	33	33	33	34	35	36	37	37	37	37	37	38	38	39
036	23	29	30	30	30	32	33	33	34	35	35	35	35	36	36	36
040	21	31	32	33	33	34	35	36	37	38	38	37	38	38	37	38
056	22	31	29	30	30	31	32	34	35	37	36	35	35	35	36	36
063	22	33	34	34	34	35	36	37	36	40	40	39	40	39	40	41
065	23	34	34	35	35	36	37	38	38	41	41	41	43	43	43	45
071*	22	34	33	34	34	35	36	37	38	37	36	36	37	36	37	38
081	20	31	32	33	33	34	35	35	36	37	36	36	37	36	37	38
085	22	32	34	34	34	35	37	38	40	40	40	41	42	43	42	43
088*	19	31	31	31	31	33	33	35	35	40	40	41	41	41	41	41
090*	20	33	34	35	35	36	40	40	41	41	41	41	41	41	41	41
098*	21	28	28	28	28	29	30	31	32	31	31	31	31	31	31	31
Mean	21	31	31	32	32	33	34	35	36	38	37	37	38	38	38	39
Std Dev	1	2	2	2	2	2	3	2	3	2	2	2	3	3	3	3
SEM	<0.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

@ Receipt.

\* Interim sacrifice animal.

## Appendix I (cont.): BODY WEIGHTS (g)

## Group 3 Males

Animal#	Rcpt <sup>a</sup>	Day	0	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-																
024	19	30	30	30	31	32	33	34	34	34	34	34	35	34	35	34
033*	20	32	33	33	32	34	36	36	35							
039*	20	33	34	34	34	35	37	39	40							
042	21	30	31	31	32	32	32	34	34	35	35	35	36	36	35	36
044	19	32	34	34	34	37	37	39	40	42	42	41	42	43	42	43
049*	21	33	33	33	33	33	35	36	37							
050*	21	28	29	29	29	30	31	32	33							
051	23	35	33	33	36	35	38	39	40	43	41	41	43	42	44	44
052	20	31	30	30	31	32	35	36	36	38	37	38	41	41	42	42
055	20	31	31	31	31	33	34	35	36	40	27	37	57	38	37	38
059*	19	29	29	29	29	30	32	33	34							
078	20	34	35	35	35	36	36	38	38	41	41	41	41	42	42	42
084	20	29	30	30	31	30	34	35	35	38	34	35	37	36	38	38
094	18	30	30	30	30	31	33	35	35	36	36	37	38	38	37	38
096	22	31	31	31	31	32	33	34	35	36	35	36	37	38	38	39
Mean	20	31	32	32	32	33	34	36	36	38	36	38	39	39	39	39
Std Dev	1	2	2	2	2	2	2	2	2	3	4	3	3	3	3	3
SEM	<0.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

<sup>a</sup> Receipt.

\* Interim sacrifice animal.

## Appendix I (cont.): BODY WEIGHTS (g)

## Group 4 Males

Animal#	Rcpt	Day	0	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-																
025*	19	28	28	30	31	31	31	32	33	35	36	34	35	35	35	36
027	20	31	31	32	32	32	33	35	36	38	38	38	39	39	39	39
046*	20	29	29	29	30	30	32	32	32	38	38	38	39	39	37	39
047	23	32	32	33	34	34	36	37	37	41	33	38	39	37	38	40
048	22	34	34	34	34	34	37	38	39	39	33	38	39	37	38	40
054*	19	29	29	30	31	31	32	32	33	40	39	39	39	38	39	40
057	21	33	33	33	35	35	37	37	37	42	43	42	42	42	41	42
058	23	36	36	35	37	37	38	40	40	39	39	39	41	41	41	42
061	21	34	34	34	36	36	37	39	37	39	39	39	41	41	41	42
062	20	32	32	32	34	34	36	37	37	39	37	37	39	38	38	39
067*	22	33	33	34	34	34	35	37	37	37	37	37	39	38	38	39
072*	19	27	27	27	28	28	29	30	31	37	35	35	36	36	36	37
073	19	30	30	31	32	32	33	34	35	40	38	38	40	40	39	40
092	22	32	32	33	35	35	36	36	37	40	38	38	40	41	40	41
095	22	33	33	33	35	35	38	38	38	40	38	39	40	41	40	41
Mean	21	32	31	32	33	33	35	36	36	39	38	38	39	39	38	40
Std Dev	1	3	2	2	2	2	3	3	3	2	3	2	2	2	2	2
SEM	<0.5	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

① Receipt.

\* Interim sacrifice animal.

## Appendix I (cont.): BODY WEIGHTS (g)

## Group 1 Females

Animal#	Rcpt <sup>a</sup>	Day 0	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-															
114	20	25	27	27	27	27	29	29	29	29	30	29	29	29	31
116	18	25	24	24	25	26	27	25	27	27	26	27	27	27	27
117	20	24	25	24	26	25	27	27	27	26	27	29	30	28	28
126*	20	24	25	25	26	27	27	28	29	30	31	31	32	33	32
129	18	25	27	27	26	28	28	29	29	29	31	31	32	33	32
130*	20	25	26	25	25	27	27	29	29	29	31	31	32	33	32
135	21	24	25	26	26	28	28	27	27	25	28	29	27	29	29
140	23	24	25	24	24	27	26	26	26	27	27	27	27	27	29
145	22	27	28	29	30	32	31	33	34	34	35	35	34	36	35
151*	23	24	25	23	24	28	28	29	29	29	29	29	29	29	31
153*	22	26	28	28	27	29	29	29	29	29	29	29	29	29	31
161*	22	25	26	26	27	29	28	27	30	30	28	30	30	31	31
165	22	25	25	26	27	28	28	29	28	28	28	29	30	31	30
168	21	24	25	25	28	27	27	28	23	28	29	30	29	29	30
178	21	24	26	27	26	27	27	27	23	28	29	30	29	29	30
Mean	21	25	26	26	26	28	28	28	28	28	29	30	30	30	30
Std Dev	2	1	1	2	2	2	1	2	3	3	3	2	2	3	2
SEM	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1	1	1	1	1	1	1

<sup>a</sup> Receipt.

\* Interim sacrifice animal.



## Appendix I (cont.): BODY WEIGHTS (g)

## Group 2 Females

Animal#	Rcpt	Day	0	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-																
099*	19	22	22	22	23	23	25	27	29	28	28	28	28	29	29	28
101	19	25	26	26	26	26	27	27	27	28	28	28	28	29	29	28
111	20	26	28	27	27	29	30	30	31	31	30	31	31	30	32	31
121	19	26	26	26	26	27	25	29	30	27	27	29	27	28	28	29
124	19	24	24	25	25	25	27	27	26	27	28	28	27	28	29	27
134	21	24	24	25	25	25	27	26	26	28	27	26	27	27	28	28
143	20	23	24	24	24	26	27	26	26	28	26	26	27	28	27	28
144	23	26	27	28	28	28	31	30	30	31	30	31	31	31	31	33
146*	22	25	26	27	27	26	30	29	28	32	32	32	32	31	32	33
155	22	26	28	28	28	29	30	30	30	32	32	32	32	31	32	33
158	20	26	28	28	28	27	28	30	29	30	31	32	31	31	33	32
169*	21	24	25	25	25	25	27	28	28	30	31	32	32	31	33	32
171*	22	26	27	26	26	27	28	27	28	30	31	32	32	31	33	32
175*	21	26	26	27	27	26	27	27	27	27	27	27	27	27	27	27
176	18	23	24	24	23	24	23	23	24	26	25	25	26	25	26	26

Mean	20	25	26	26	26	26	27	28	28	29	28	29	29	29	30	30
Std Dev	1	1	2	2	2	2	2	2	2	2	2	3	2	2	2	3
SEM	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1	1	1	1	1	1	1	1	1	1

0 Receipt.

\* Interim sacrifice animal.

**Appendix I (cont.): BODY WEIGHTS (g)**  
**Group 3 Females**

Animal#	Rept#	Day 0	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
<b>87C00-</b>															
105	20	25	25	26	26	28	28	28	28	28	28	30	29	29	31
109*	20	27	28	30	30	30	30	32							
112*	18	25	25	25	25	27	27	26							
118	19	25	26	26	27	27	29	28	29	29	29	30	31	29	31
122	20	25	25	25	25	25	25	26	26	27	27	27	26	28	27
125*	19	25	27	27	26	27	27	27							
132*	19	25	25	24	25	26	26	26							
150	23	25	25	26	25	27	27	26	27	28	28	29	27	28	28
152	21	26	27	27	27	28	29	28	29	29	30	29	29	29	30
160	22	26	26	27	27	27	28	28	29	30	29	29	29	30	30
162*	23	23	23	24	23	23	23	25							
163	22	25	26	25	27	27	27	28	29	29	29	31	30	31	32
167	22	25	26	26	28	27	20	28	27	27	28	29	30	30	31
173	21	26	26	29	28	28	25	26	27	26	27	28	29	29	29
181	20	25	25	26	26	27	27	27	28	28	28	29	29	30	29
Mean	21	25	26	26	26	27	27	27	28	28	28	29	29	29	30
Std Dev	2	1	1	2	2	2	3	2	1	1	1	1	1	1	2
SEM	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5

@ Receipt.

\* Interim sacrifice animal.

## Appendix I (cont.): BODY WEIGHTS (g)

## Group 4 Females

Animal#	Rcpt <sup>0</sup>	Day 0	WK1	WK2	WK3	WK4	WK5	WK6	WK7	WK8	WK9	WK10	WK11	WK12	WK13
87C00-															
107*	19	25	25	25	26	27	27	26	23	27	26	26	25	27	27
120	18	23	22	23	23	23	25	25	25	27	26	26	25	27	27
127*	19	25	25	25	25	27	27	27	27	26	25	27	27	27	27
128	19	26	25	25	25	26	26	25	26	25	27	27	27	27	27
139	20	24	24	24	25	26	26	26	25	26	25	27	27	27	27
148*	23	25	25	27	28	28	28	29	29	26	26	26	27	27	27
149	21	24	24	24	24	25	25	26	26	25	26	26	27	26	27
154	21	25	25	25	27	28	28	29	28	29	31	28	30	29	28
156	22	26	25	26	26	27	28	27	23	29	28	31	30	30	31
157	22	25	25	26	26	26	26	27	27	28	31	30	29	30	31
164*	23	27	25	26	25	27	28	27	29	28	28	29	29	29	29
166*	23	26	26	27	28	28	28	29	29	28	28	29	29	29	29
174	20	24	25	25	27	28	28	29	28	28	25	28	27	26	26
180	22	25	25	25	26	26	28	28	28	28	25	28	27	26	26
182	20	25	26	26	26	28	28	27	29	27	29	28	30	31	29
Mean	21	25	25	25	26	27	27	27	26	27	28	28	28	28	28
Std Dev	2	1	1	1	1	1	1	1	2	2	2	2	2	2	2
SEM	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5	1	<0.5	1	1	1	1	1

<sup>0</sup> Receipt.

\* Interim sacrifice animal.

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**Appendix J: CLINICAL SIGNS**  
**List of Clinical Signs Abbreviations**

<u>Symbol</u>	<u>Meaning</u>
a	alopecia
ag	aggressive
c	chewing
d	dehydrated
hy	hyperactive
i	irritable
n	normal
nt	necrosis of the tail
o	ocular
sc	scab
sk	skeletal deformity of carpus and tarsus
st	increased startle reflex
sw	swelling right side of jaw
tw	twitching

## Appendix J (cont.): CLINICAL OBSERVATIONS IN MICE ADMINISTERED NITROGUANIDINE

[illegible]

\* Interim sacrifice animal

**corneal vascularization**

\$ right pupil dilated, slow constriction



## Appendix J (cont.): CLINICAL OBSERVATIONS IN MICE ADMINISTERED NITROGUANIDINE

Animal#	-3	6	13	20	27	34	41	48	55	62	69	76	83	90	Total Signs
87C00-															
114															n
116									i				hy,c		i,hy,c
117													hy,c		i,hy,c
126*		i													i
129															i
130*															i
135															i,st
140															i
145															i
151*															i
153*															i
161*															i
165															i
168															n
178															i,ag
099*															c
101															i
111															n
121															n
124															n
134															n
143															d,i,o
144															i,o,ag
146*															n
155															i
158															a
169*															i
171*															i
175*															n
176															n

\* interim sacrifice animal

§ corneal opacity; § cataract; § corneal vascularization; § conjunctivitis



## Appendix J (cont.): CLINICAL OBSERVATIONS IN MICE ADMINISTERED NITROGUANIDINE

[illegible]

\* interim sacrifice animal

corneal opacity

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## Appendix K: SERUM CHEMISTRY

## List of Serum Chemistry Abbreviations/Units

A-G	Albumin/Globulin ratio
ALB	Albumin (g/dl)
ALK	Alkaline Phosphokinase (U/L)
ALT	Alanine Amino-Transferase (U/L)
AST	Aspartate Amino-Transferase (U/L)
BILI	Total Bilirubin (mg/dl)
BUN	Blood Urea Nitrogen (mg/dl)
CAL	Calcium (mg/dl)
CHOL	Cholesterol (mg/dl)
CK	Creatine Phosphokinase (U/L)
CL	Chloride (mMol/L)
CR	Creatinine (mg/dl)
GLU	Glucose (mg/dl)
IRON	Iron (µg/dl)
K	Potassium (Meq/L)
LDHL	Lactic Dehydrogenase (U/L)
MAG	Magnesium (mg/dl)
NA	Sodium (Meq/L)
NT	Not tabulated
TP	Total Protein (g/dl)
TRIG	Triglyceride (mg/dl)
URIC	Uric Acid (mg/dl)

LETTERMAN ARMY INSTITUTE OF RESEARCH Appendix K: SERUM CHEMISTRY STUDY START DATE: 01-APR-87  
 DIV OF TOXICOLOGY STUDY NUMBER: 86007 MOUSE/ICR  
 PRESIDIO OF SAN FRANCISCO, CA 94129 SUBCHRONIC/90 DAY FEEDING

ANIMAL NUMBER	SEX	GROUP/ SUBGROUP	DAY OF STUDY	AST	BUN	CK	ALB	BILI	CL	GLU	IRON	ALK	LDHL	MAG
87C0037	M	1/1	44	104.9	34.1	185.6	2.72	NT	112.	203.9	NT	45.1	716.1	2.40
87C0041	M	1/1	44	59.5	26.2	171.5	2.41	0.01	112.	268.8	156.	52.0	259.9	2.51
87C0077	M	1/1	44	65.0	30.0	135.6	2.14	0.00	114.	317.2	196.	53.6	245.9	2.41
87C0079	M	1/1	44	69.4	32.4	111.9	2.41	0.02	109.	270.4	200.	49.8	214.3	2.29
87C0080	M	1/1	44	83.8	27.9	338.2	2.46	NT	113.	248.3	170.	51.1	488.2	2.41
PARAMETER MEANS:				76.52	30.12	188.56	2.43	0.01	112.00	261.72	180.50	50.32	384.88	2.40
STANDARD DEVIATIONS:				18.24	3.22	88.56	0.21	0.01	1.87	41.01	21.06	3.23	214.72	0.09
87C0020	M	2/1	44	106.3	32.4	229.8	2.09	NT	107.	256.1	196.	66.2	310.9	3.26
87C0071	M	2/1	44	58.3	34.4	139.4	2.49	0.03	110.	250.6	232.	40.9	432.1	2.12
87C0088	M	2/1	44	83.7	28.7	288.3	2.40	NT	111.	247.2	163.	64.0	407.0	2.44
87C0090	M	2/1	44	55.5	26.3	204.2	2.49	0.00	111.	286.1	193.	67.0	282.4	2.63
87C0098	M	2/1	44	NT	NT	NT	NT	NT	112.	NT	NT	NT	NT	NT
PARAMETER MEANS:				75.95	30.45	215.43	2.37	0.02	110.20	260.00	196.00	59.53	358.10	2.61
STANDARD DEVIATIONS:				23.88	3.64	61.71	0.19	0.02	1.92	17.78	28.25	12.48	72.63	0.48
87C0033	M	3/1	44	125.7	34.5	180.5	1.77	0.03	114.	135.7	119.	11.6	567.7	2.64
87C0039	M	3/1	44	98.3	44.7	86.1	2.16	NT	111.	259.7	181.	45.8	486.8	2.36
87C0049	M	3/1	44	NT	NT	NT	NT	NT	109.	NT	NT	NT	NT	NT
87C0050	M	3/1	44	150.6	25.8	184.0	2.17	NT	107.	244.8	NT	35.7	432.3	2.80
PARAMETER MEANS:				124.87	35.00	150.20	2.03	0.03	110.25	213.40	150.00	31.03	495.60	2.60
STANDARD DEVIATIONS:				26.16	9.46	55.54	0.23	-	2.99	67.70	43.84	17.57	68.13	0.22
87C0025	M	4/1	44	199.6	28.0	600.8	2.32	NT	107.	202.9	NT	47.7	932.6	3.07
87C0046	M	4/1	44	72.8	25.8	270.0	2.47	NT	109.	209.7	192.	53.9	682.9	2.65
87C0054	M	4/1	44	95.7	21.9	149.2	2.28	NT	108.	233.5	NT	37.8	244.8	2.55
87C0067	M	4/1	44	172.4	27.8	771.7	2.05	NT	109.	320.7	146.	36.0	520.1	2.80
87C0072	M	4/1	44	153.0	26.2	375.0	2.46	NT	110.	252.1	NT	50.0	418.1	2.86
PARAMETER MEANS:				136.70	25.94	433.34	2.32	-	108.60	243.78	169.00	45.08	559.70	2.79
STANDARD DEVIATIONS:				55.18	2.46	251.67	0.17	-	1.14	47.23	32.53	7.82	262.21	0.20

LETTERMAN ARMY INSTITUTE OF RESEARCH Appendix K: SERUM CHEMISTRY 01-APR-87  
 DIV OF TOXICOLOGY STUDY NUMBER: 86007 MOUSE/ICR  
 PRESIDIO OF SAN FRANCISCO, CA 94129SUBCHRONIC/90 DAY FEEDING

ANIMAL NUMBER	SEX	GROUP/ SUBGROUP	DAY OF STUDY	NA	CAL	CHOL	CR	ALT	TP	URIC	K	TRIG	A-G
87C0037	M	1/1	44	NT	8.2	NT	0.44	38.8	4.7	0.9	NT	NT	1.34
87C0041	M	1/1	44	154	8.3	76.5	0.54	34.3	4.6	1.6	6.3	155	1.10
87C0077	M	1/1	44	150	8.0	35.2	0.54	38.2	4.6	1.2	6.1	93	0.88
87C0079	M	1/1	44	155	8.7	89.3	0.56	52.0	4.7	1.7	4.4	73	1.07
87C0080	M	1/1	44	154	8.8	105.9	0.54	56.6	5.0	1.3	5.7	151	0.96
PARAMETER MEANS:				153.25	8.40	76.73	0.52	43.98	4.72	1.34	5.63	118.00	1.07
STANDARD DEVIATIONS:				2.22	0.34	30.19	0.05	9.72	0.16	0.32	0.85	41.26	0.17
87C0020	M	2/1	44	154	9.3	68.6	0.80	47.5	4.5	1.7	7.2	205	0.86
87C0071	M	2/1	44	155	7.9	83.1	0.49	26.7	4.6	1.4	4.8	146	1.16
87C0088	M	2/1	44	155	7.0	67.3	0.51	42.8	4.5	1.2	5.5	96	1.15
87C0090	M	2/1	44	155	8.4	100.1	0.57	46.5	4.6	2.2	6.7	88	1.15
87C0098	M	2/1	44	154	NT	NT	NT	NT	NT	NT	6.9	NT	NT
PARAMETER MEANS:				154.60	8.15	79.78	0.59	40.88	4.55	1.63	6.22	133.75	1.08
STANDARD DEVIATIONS:				0.55	0.96	15.33	0.14	9.66	0.06	0.43	1.02	53.99	0.15
87C0033	M	3/1	44	156	8.9	47.3	0.56	22.0	5.6	1.7	5.7	114	0.46
87C0039	M	3/1	44	154	7.9	44.4	0.64	30.9	4.0	1.7	6.5	172	1.17
87C0049	M	3/1	44	160	NT	NT	NT	NT	NT	NT	5.4	NT	NT
87C0050	M	3/1	44	154	8.0	NT	0.55	46.8	4.4	2.2	6.3	NT	0.96
PARAMETER MEANS:				156.00	8.27	45.85	0.58	33.23	4.67	1.87	5.98	143.00	0.86
STANDARD DEVIATIONS:				2.83	0.55	2.05	0.05	12.56	0.83	0.29	0.51	41.01	0.36
87C0025	M	4/1	44	155	8.6	NT	0.75	45.0	4.6	1.5	6.5	NT	1.01
87C0046	M	4/1	44	155	8.7	101.8	0.54	29.5	5.3	2.1	6.3	184	0.87
87C0054	M	4/1	44	153	8.6	NT	0.53	63.2	4.6	2.2	7.2	NT	0.97
87C0067	M	4/1	44	152	8.1	126.9	0.57	55.3	4.5	2.1	6.7	147	0.85
87C0072	M	4/1	44	159	9.0	NT	0.56	63.3	5.2	1.5	6.1	NT	0.89
PARAMETER MEANS:				154.80	8.60	114.35	0.59	51.26	4.84	1.88	6.56	165.50	0.92
STANDARD DEVIATIONS:				2.68	0.32	17.75	0.09	14.29	0.38	0.35	0.42	26.16	0.07

LETTERMAN ARMY INSTITUTE OF RESEARCH				Appendix K: SERUM CHEMISTRY				STUDY START DATE: 01-APR-87						
DIV OF TOXICOLOGY				STUDY NUMBER: 86007				MOUSE/ICR						
PRESIDIO OF SAN FRANCISCO, CA 94129				SUBCHRONIC/90 DAY FEEDING										
ANIMAL	GROUP/	DAY OF												
NUMBER	SEX	SUBGROUP	STUDY	AST	BUN	CK	ALB	BILI	CL	GLU	IRON	ALK	LDHL	MAG
87C0021	M	1/1	93	126.9	29.6	95.4	3.1	NT	112.	243.6	NT	93.1	323.1	2.88
87C0026	M	1/1	93	150.8	46.0	106.9	2.5	.03	109.	276.0	207.	45.4	428.7	2.42
87C0032	M	1/1	93	143.1	34.9	171.9	3.0	.02	111.	280.6	NT	37.7	366.1	2.32
87C0038	M	1/1	93	122.9	30.4	270.7	2.4	.07	109.	252.3	212.	38.6	355.2	2.28
87C0045	M	1/1	93	96.5	29.2	171.8	3.0	.04	113.	207.9	NT	32.4	400.2	2.65
87C0066	M	1/1	93	324.0	30.1	133.9	2.9	NT	116.	137.6	NT	52.7	615.2	2.56
87C0075	M	1/1	93	71.6	31.8	57.2	2.8	.01	113.	240.6	NT	42.3	216.6	2.12
87C0082	M	1/1	93	156.8	21.7	188.4	3.0	NT	111.	250.0	202.	52.9	540.7	2.76
87C0093	M	1/1	93	64.1	18.2	116.0	3.1	NT	106.	229.7	215.	66.3	238.2	2.47
PARAMETER MEANS:				139.63	30.21	145.80	2.87	0.03	111.11	235.37	209.00	51.27	387.11	2.50
STANDARD DEVIATIONS:				76.70	7.84	62.95	0.25	0.02	2.89	42.78	5.72	18.69	129.58	0.24
87C0030	M	2/1	93	59.9	30.7	115.4	2.5	NT	111.	273.5	NT	34.3	223.2	2.44
87C0031	M	2/1	93	261.4	40.9	519.3	2.8	.08	110.	317.5	247.	36.4	616.1	2.26
87C0034	M	2/1	93	NT	NT	NT	NT	NT	109.	NT	NT	NT	NT	2.02
87C0036	M	2/1	93	171.6	41.3	127.4	3.0	.00	112.	286.7	NT	61.7	437.1	2.44
87C0040	M	2/1	93	71.0	20.8	140.2	2.7	.03	107.	253.6	275.	52.0	273.4	2.25
87C0056	M	2/1	93	64.4	22.1	39.2	2.8	NT	107.	271.0	NT	23.8	200.3	2.49
87C0063	M	2/1	93	174.6	19.6	413.7	2.6	.06	113.	250.5	241.	35.7	560.4	2.37
87C0065	M	2/1	93	NT	22.5	51.5	2.7	NT	111.	NT	NT	53.2	247.0	2.40
87C0085	M	2/1	93	73.5	24.6	80.0	3.3	NT	110.	232.0	219.	53.0	209.3	2.64
PARAMETER MEANS:				125.20	27.81	185.84	2.80	0.04	110.00	269.26	245.50	43.76	345.85	2.37
STANDARD DEVIATIONS:				78.23	8.86	179.02	0.25	0.04	2.06	27.80	23.06	12.94	167.88	0.18

LETTERMAN ARMY INSTITUTE OF RESEARCH Appendix K: SERUM CHEMISTRY STUDY START DATE: 01-APR-87  
 DIV OF TOXICOLOGY STUDY NUMBER: 86007 MOUSE ICR  
 PRESIDIO OF SAN FRANCISCO, CA 94129 SUBCHRONIC/90 DAY FEEDING

ANIMAL NUMBER	SEX	GROUP/ SUBGROUP	DAY OF STUDY	AST	BUN	CK	ALB	BILI	CL	GLU	IRON	ALK	LDHL	MAG
87C0024	M	3/1	93	101.3	30.2	273.6	2.8	NT	111.	277.6	NT	46.6	329.7	2.48
87C0042	M	3/1	93	NT	NT	NT	NT	NT	110.	NT	NT	NT	NT	2.44
87C0044	M	3/1	93	137.4	23.9	175.6	2.7	.05	109.	362.9	NT	35.7	346.7	2.18
87C0051	M	3/1	93	84.0	24.4	87.5	2.8	.04	109.	287.4	NT	23.2	264.5	2.09
87C0052	M	3/1	93	176.8	36.4	61.9	2.6	NT	111.	230.1	NT	49.5	319.3	2.29
87C0078	M	3/1	93	NT	NT	NT	NT	NT	110.	NT	NT	NT	NT	2.41
87C0084	M	3/1	93	NT	NT	NT	NT	NT	112.	NT	NT	NT	NT	2.63
87C0094	M	3/1	93	117.3	19.0	64.6	2.7	NT	109.	221.9	NT	49.1	295.7	2.68
87C0096	M	3/1	93	83.0	19.6	43.9	2.9	NT	106.	241.0	193.	44.7	278.1	2.38
PARAMETER MEANS:				116.63	25.58	117.85	2.75	0.05	109.67	270.15	193.00	41.47	305.67	2.40
STANDARD DEVIATIONS:				36.01	6.66	89.39	0.10	0.01	1.73	52.42	-	10.26	31.63	2.19
87C0027	M	4/1	93	88.8	44.1	197.1	2.7	.01	110.	215.6	388.	47.3	378.2	2.49
87C0047	M	4/1	93	203.9	27.0	168.6	2.9	.02	109.	256.8	NT	26.8	441.2	2.51
87C0048	M	4/1	93	73.3	22.8	21.5	2.3	.01	109.	265.3	NT	25.0	261.2	2.25
87C0057	M	4/1	93	NT	17.3	NT	2.9	NT	111.	NT	NT	37.5	NT	2.52
87C0058	M	4/1	93	81.8	19.5	49.6	2.9	NT	112.	269.0	NT	43.9	362.3	2.41
87C0061	M	4/1	93	112.0	31.3	50.4	3.1	.11	110.	295.4	175.	69.3	278.8	2.26
87C0062	M	4/1	93	NT	22.6	NT	3.1	NT	109.	NT	NT	59.9	NT	2.71
87C0073	M	4/1	93	259.9	19.2	178.5	2.6	NT	110.	327.4	NT	56.6	547.9	2.47
87C0092	M	4/1	93	125.7	21.5	153.6	2.8	NT	111.	266.5	184.	30.2	509.5	2.27
87C0095	M	4/1	93	86.0	22.3	166.7	2.9	NT	109.	364.1	NT	64.8	298.2	2.18
PARAMETER MEANS:				128.93	24.76	123.25	2.82	0.04	110.00	282.51	249.00	46.13	384.66	2.51
STANDARD DEVIATIONS:				67.44	7.90	70.16	0.24	0.05	1.05	45.84	120.46	16.12	106.83	2.28

LETTERMAN ARMY INSTITUTE OF RESEARCH      Appendix K: SERUM CHEMISTRY      STUDY START DATE: 01-APR-87  
 DIV OF TOXICOLOGY      STUDY NUMBER: 86007      MOUSE/ICR  
 PRESIDIO OF SAN FRANCISCO, CA 94129      SUBCHRONIC/90 DAY FEEDING

ANIMAL NUMBER	SEX	GROUP/ SUBGROUP	DAY OF STUDY	NA	CAL	CHOL	CR	ALT	TP	URIC	K	TRIG	A-G
87C0021	M	1/1	93	158.3	9.1	93.0	0.50	50.7	5.1	NT	7.4	136	1.50
87C0026	M	1/1	93	156.3	8.4	117.0	0.50	57.4	4.3	2.1	6.8	151	1.40
87C0032	M	1/1	93	158.1	8.9	76.6	0.50	61.2	5.5	2.4	6.9	170	1.20
87C0038	M	1/1	93	157	8.0	88.1	0.50	39.6	4.6	1.9	6.4	154	1.10
87C0045	M	1/1	93	163	9.1	91.4	0.50	53.4	5.1	4.0	7.1	141	1.40
87C0066	M	1/1	93	160	9.0	NT	0.30	54.3	5.2	NT	8.5	NT	1.30
87C0075	M	1/1	93	160.8	8.8	93.9	0.40	51.8	4.9	1.0	5.9	114	1.40
87C0082	M	1/1	93	158.4	9.8	70.7	0.50	84.5	4.8	NT	7.7	70	1.70
87C0093	M	1/1	93	158.7	9.7	132.4	0.40	24.4	5.1	2.1	6.1	133	1.50
PARAMETER MEANS:				158.96	8.98	95.39	0.46	53.03	4.96	2.25	6.98	133.63	1.39
STANDARD DEVIATIONS:				2.04	0.57	20.27	0.07	16.14	0.35	0.98	0.82	30.55	0.18
87C0030	M	2/1	93	158.5	8.8	94.9	0.50	38.0	4.7	2.3	6.6	107	1.20
87C0031	M	2/1	93	154.5	8.3	54.0	0.40	37.6	4.6	3.8	7.1	57	1.60
87C0034	M	2/1	93	157.4	8.2	NT	NT	NT	NT	NT	5.5	NT	NT
87C0036	M	2/1	93	157.1	8.3	65.1	0.40	54.1	4.4	1.4	6.7	110	2.00
87C0040	M	2/1	93	158	8.5	96.7	0.40	41.1	4.6	2.5	5.5	162	1.40
87C0056	M	2/1	93	157.4	8.7	NT	0.40	39.3	4.8	NT	6.0	NT	1.40
87C0063	M	2/1	93	157.6	8.6	77.0	0.40	58.2	4.8	1.4	5.9	105	1.20
87C0065	M	2/1	93	158	9.3	NT	0.40	50.2	5.0	NT	7.0	NT	1.20
87C0085	M	2/1	93	159.9	9.6	98.3	0.50	31.5	5.0	1.8	6.3	84	1.90
PARAMETER MEANS:				157.60	8.70	81.00	0.43	43.75	4.74	2.20	6.29	104.17	1.49
STANDARD DEVIATIONS:				1.43	0.47	18.64	0.05	9.30	0.21	0.91	0.60	34.70	0.32



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Appendix K: SERUM CHEMISTRY  
STUDY NUMBER: 86007

STUDY START DATE: 01-APR-87  
MOUSE/ICR  
SUBCHRONIC/90 DAY FEEDING

ANIMAL NUMBER	SEX	GROUP/ SUBGROUP	DAY OF STUDY	NA	CAL	CHOL	CR	ALT	TP	URIC	K	TRIG	A-G
87C0024	M	3/1	93	159.6	8.7	67.5	0.60	38.6	4.7	1.2	5.4	145	1.50
87C0042	M	3/1	93	159.9	8.8	NT	NT	NT	NT	NT	7.3	NT	NT
87C0044	M	3/1	93	156	8.5	136.7	0.60	44.6	5.0	1.1	5.5	148	1.20
87C0051	M	3/1	93	157.8	8.8	96.0	0.60	41.2	4.9	1.4	5.7	141	1.30
87C0052	M	3/1	93	160.4	8.5	154.0	0.40	97.2	5.2	NT	7.2	195	1.00
87C0078	M	3/1	93	157.3	9.4	NT	NT	NT	NT	0.0	7.5	NT	NT
87C0084	M	3/1	93	160.5	9.6	NT	NT	NT	NT	NT	10.0	NT	NT
87C0094	M	3/1	93	158.1	9.2	111.5	0.40	46.5	4.9	1.1	6.9	74	1.30
87C0096	M	3/1	93	158.7	9.4	84.7	0.50	34.3	4.8	1.2	5.1	133	1.50
PARAMETER MEANS:				158.70	8.99	108.40	0.52	50.40	4.92	1.00	6.73	139.33	1.30
STANDARD DEVIATIONS:				1.53	0.42	32.49	0.10	23.33	0.17	0.50	1.54	38.77	0.19
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87C0027	M	4/1	93	160.3	8.7	80.8	0.50	41.9	4.8	0.4	6.5	202	1.30
87C0047	M	4/1	93	156.8	8.8	123.0	0.40	40.5	4.8	1.1	6.2	97	1.50
87C0048	M	4/1	93	160.5	9.0	67.0	0.50	23.6	5.6	2.1	5.5	75	0.70
87C0057	M	4/1	93	156.3	8.5	NT	0.30	50.2	5.0	NT	7.2	NT	1.40
87C0058	M	4/1	93	159.3	9.3	82.1	0.50	46.6	4.9	1.5	7.0	73	1.40
87C0061	M	4/1	93	160.3	9.1	105.0	0.60	31.4	4.9	2.2	7.5	211	1.80
87C0062	M	4/1	93	159	9.2	NT	0.40	47.8	5.0	NT	7.5	NT	1.60
87C0073	M	4/1	93	155.9	9.5	NT	0.40	55.0	4.6	NT	6.5	NT	1.30
87C0092	M	4/1	93	159.2	8.7	118.3	0.40	26.2	4.9	1.6	5.1	149	1.30
87C0095	M	4/1	93	155.9	9.9	NT	0.50	36.8	5.0	NT	8.6	NT	1.40
PARAMETER MEANS:				158.35	9.07	96.03	0.45	40.00	4.95	1.48	6.76	134.50	1.37
STANDARD DEVIATIONS:				1.91	0.42	22.68	0.08	10.44	0.26	0.67	1.03	62.21	0.28

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Appendix K: SERUM CHEMISTRY  
STUDY NUMBER: 86007

STUDY START DATE: 01-APR-87  
MOUSE/ICR  
SUBCHRONIC/90 DAY FEEDING

ANIMAL NUMBER	SEX	GROUP/ SUBGROUP	DAY OF STUDY	AST	BUN	CK	ALB	BILI	CL	GLU	IRON	ALK	LDHL	MAG
87C0126	F	1/2	43	90.1	29.0	272.6	2.32	NT	115.	264.9	257.	83.0	358.9	2.89
87C0130	F	1/2	43	NT	NT	NT	NT	NT	113.	NT	NT	NT	NT	NT
87C0151	F	1/2	43	362.6	22.2	494.3	2.24	NT	114.	202.1	199.	58.7	602.8	2.35
87C0153	F	1/2	43	190.4	28.4	385.7	2.63	NT	113.	197.4	217.	49.0	430.5	2.53
PARAMETER MEANS:				214.37	26.53	384.20	2.40	-	113.75	221.47	224.33	63.57	464.07	2.59
STANDARD DEVIATIONS:				137.82	3.76	110.86	0.21	-	0.96	37.69	29.69	17.51	125.37	0.27
87C0146	F	2/2	43	NT	34.0	NT	2.54	NT	115.	NT	NT	92.0	NT	2.41
87C0169	F	2/2	43	87.7	20.3	579.9	2.91	NT	112.	234.6	237.	60.9	408.2	3.03
87C0171	F	2/2	43	151.9	39.3	419.7	2.89	0.00	112.	217.5	181.	60.8	525.1	2.45
87C0175	F	2/2	43	550.4	29.3	978.9	2.39	NT	113.	190.3	NT	64.2	806.1	1.87
PARAMETER MEANS:				263.33	30.73	659.50	2.68	0.00	113.00	214.13	209.00	69.48	579.80	2.44
STANDARD DEVIATIONS:				250.67	8.06	287.97	0.26	-	1.41	22.34	39.60	15.10	204.51	0.47
87C0109	F	3/2	43	309.0	33.6	739.9	2.74	NT	113.	206.9	179.	66.6	609.2	2.42
87C0112	F	3/2	43	154.6	19.6	361.5	2.85	NT	112.	217.8	239.	98.6	564.9	2.73
87C0125	F	3/2	43	83.7	16.8	249.1	2.96	0.03	112.	240.4	131.	92.6	297.8	2.82
87C0132	F	3/2	43	748.3	23.8	3663.9	2.96	NT	114.	212.6	180.	109.2	1203.8	2.64
PARAMETER MEANS:				323.90	23.45	1253.60	2.88	0.03	112.75	219.43	182.25	91.75	668.93	2.65
STANDARD DEVIATIONS:				298.16	7.35	1620.52	0.11	-	0.96	14.67	44.21	18.12	382.19	0.17
87C0107	F	4/2	43	134.7	20.0	216.6	2.70	NT	114.	214.7	NT	69.2	316.1	2.76
87C0127	F	4/2	43	126.4	32.9	343.0	2.83	NT	112.	230.7	212.	100.8	697.8	3.24
87C0148	F	4/2	43	NT	23.3	NT	2.90	NT	112.	NT	NT	142.4	NT	2.68
87C0164	F	4/2	43	217.0	25.3	441.2	2.53	NT	112.	194.7	233.	98.3	516.1	2.31
87C0166	F	4/2	43	146.0	24.4	568.3	2.83	0.02	111.	201.7	136.	98.8	471.7	2.70
PARAMETER MEANS:				156.03	25.18	392.28	2.76	0.02	112.20	210.45	193.67	101.90	500.43	2.74
STANDARD DEVIATIONS:				41.44	4.76	149.07	0.15	-	1.10	15.84	51.03	26.14	157.06	0.33

LETTERMAN ARMY INSTITUTE OF RESEARCH Appendix K: SERUM CHEMISTRY STUDY START DATE: 01-APR-87  
 DIV OF TOXICOLOGY STUDY NUMBER: 86007 MOUSE/ICR  
 PRESIDIO OF SAN FRANCISCO, CA 94129 SUBCHRONIC/90 DAY FEEDING

ANIMAL NUMBER	SEX	GROUP/ SUBGROUP	DAY OF STUDY	NA	CAL	CHOL	CR	ALT	TP	URIC	K	TRIG	A-G
87C0126	F	1/2	43	154	8.9	57.9	0.73	29.5	4.5	1.1	5.9	149	1.05
87C0130	F	1/2	43	149	NT	NT	NT	NT	NT	NT	6.0	NT	NT
87C0151	F	1/2	43	153	8.1	68.6	0.57	39.1	4.5	1.1	5.6	71	1.00
87C0153	F	1/2	43	153	8.3	10.2	0.56	38.4	4.8	0.8	5.2	61	1.21
PARAMETER MEANS:													
				152.25	8.43	45.57	0.62	35.67	4.60	1.00	5.68	93.67	1.09
STANDARD DEVIATIONS:				2.22	0.42	31.09	0.10	5.35	0.17	0.17	0.36	48.18	0.11
87C0146	F	2/2	43	161	8.8	NT	0.63	48.9	4.7	NT	7.2	NT	1.17
87C0169	F	2/2	43	152	8.9	59.0	0.57	35.4	5.3	0.9	6.1	80	1.20
87C0171	F	2/2	43	153	8.6	72.4	0.64	30.9	5.2	1.2	6.6	67	1.25
87C0175	F	2/2	43	153	7.8	NT	0.68	41.9	4.5	1.2	5.4	NT	1.14
PARAMETER MEANS:													
				154.75	8.53	65.70	0.63	39.28	4.93	1.10	6.32	73.50	1.19
STANDARD DEVIATIONS:				4.19	0.50	9.48	0.05	7.85	0.39	0.17	0.76	9.19	0.05
87C0109	F	3/2	43	154	7.9	89.8	0.62	44.7	4.9	2.4	4.8	108	1.25
87C0112	F	3/2	43	155	8.1	58.1	0.51	24.3	4.8	1.1	5.3	74	1.45
87C0125	F	3/2	43	155	8.3	76.0	0.62	24.2	5.0	1.2	5.4	58	1.46
87C0132	F	3/2	43	157	8.4	36.7	0.61	52.6	4.7	1.7	6.2	74	1.72
PARAMETER MEANS:													
				155.25	8.18	65.15	0.59	36.45	4.85	1.60	5.43	78.50	1.47
STANDARD DEVIATIONS:				1.26	0.22	22.98	0.05	14.45	0.13	0.59	0.58	21.06	0.19
87C0107	F	4/2	43	154	8.2	NT	0.53	26.0	4.9	1.3	6.6	NT	1.23
87C0127	F	4/2	43	155	8.4	22.1	0.58	31.0	4.8	2.2	5.8	89	1.46
87C0148	F	4/2	43	162	8.8	NT	1.22	21.0	5.1	NT	4.7	NT	1.31
87C0164	F	4/2	43	141	7.7	53.7	0.56	39.0	4.5	1.4	4.7	61	1.29
87C0166	F	4/2	43	160	8.5	59.4	0.64	36.0	4.8	1.6	4.6	94	1.44
PARAMETER MEANS:													
				154.40	8.32	45.07	0.71	30.60	4.82	1.63	5.28	81.33	1.35
STANDARD DEVIATIONS:				8.20	0.41	20.09	0.29	7.30	0.22	0.40	0.89	17.79	0.10

LETTERMAN ARMY INSTITUTE OF RESEARCH DIV OF TOXICOLOGY PRESIDIO OF SAN FRANCISCO, CA 94129				Appendix K: SERUM CHEMISTRY STUDY NUMBER: 86007				STUDY START DATE: 01-APR-87 MOUSE/ICR SUBCHRONIC/90 DAY FEEDING						
ANIMAL NUMBER	SEX	GROUP/ SUBGROUP	DAY OF STUDY	AST	BUN	CK	ALB	BILI	CL	GLU	IRON	ALK	LDHL	MAG
87C0114	F	1/2	92	NT	35.3	NT	NT	NT	111.	NT	NT	66.8	NT	2.54
87C0116	F	1/2	92	NT	30.5	NT	NT	NT	113.	NT	NT	59.6	NT	2.42
87C0117	F	1/2	92	90.6	28.8	74.4	2.5	.05	112.	272.2	NT	81.1	278.2	2.26
87C0129	F	1/2	92	86.0	28.6	148.3	3.2	NT	117.	263.7	255.	59.6	212.4	2.56
87C0135	F	1/2	92	130.1	27.2	193.6	2.8	NT	117.	NT	NT	58.3	319.9	2.42
87C0140	F	1/2	92	95.6	21.5	115.5	2.9	NT	115.	274.0	NT	89.2	84.5	2.69
87C0145	F	1/2	92	NT	17.8	NT	NT	NT	112.	NT	NT	67.5	NT	2.46
87C0165	F	1/2	92	80.3	28.1	197.3	3.0	NT	116.	268.1	NT	93.7	276.3	2.67
87C0168	F	1/2	92	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	2.30
PARAMETER MEANS:				96.52	27.23	145.82	2.88	0.05	114.13	269.50	255.00	71.97	234.26	2.48
STANDARD DEVIATIONS:				19.60	5.38	52.34	0.26	-	2.42	4.59	-	14.10	92.11	0.15
87C0101	F	2/2	92	NT	NT	NT	NT	NT	112.	NT	NT	NT	NT	2.69
87C0111	F	2/2	92	98.3	35.1	76.5	2.5	.01	114.	284.0	262.	62.2	236.4	2.66
87C0121	F	2/2	92	119.4	21.3	113.3	2.8	.07	114.	231.6	301.	67.8	262.6	2.38
87C0124	F	2/2	92	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	2.73
87C0176	F	2/2	92	156.5	25.5	87.4	2.9	.03	114.	229.9	NT	68.1	157.0	2.36
87C0143	F	2/2	92	NT	NT	NT	NT	NT	109.	NT	NT	NT	NT	2.66
87C0144	F	2/2	92	NT	NT	NT	NT	NT	116.	NT	NT	NT	NT	2.43
87C0155	F	2/2	92	149.7	22.0	67.3	2.9	.03	112.	238.6	NT	45.9	330.5	2.53
87C0158	F	2/2	92	NT	23.3	NT	2.9	NT	113.	NT	NT	59.3	NT	2.62
PARAMETER MEANS:				130.98	25.44	86.13	2.80	0.04	113.00	246.03	281.50	60.66	246.63	2.56
STANDARD DEVIATIONS:				27.10	5.63	19.89	0.17	0.03	2.07	25.59	27.58	9.06	71.71	0.14

LETTERMAN ARMY INSTITUTE OF RESEARCH Appendix K: SERUM CHEMISTRY STUDY START DATE: 01-APR-87  
 DIV OF TOXICOLOGY STUDY NUMBER: 86007 MOUSE/ICR  
 PRESIDIO OF SAN FRANCISCO, CA 94129 SUBCHRONIC/90 DAY FEEDING

ANIMAL NUMBER	SEX	GROUP/ SUBGROUP	DAY OF STUDY	AST	BUN	CK	ALB	BILI	CL	GLU	IRON	ALK	LDHL	MAG
87C0105	F	3/2	92	77.7	28.5	118.5	2.6	.03	113.	217.0	285.	58.3	369.3	2.49
87C0118	F	3/2	92	NT	37.5	NT	NT	NT	116.	NT	NT	68.2	NT	2.34
87C0122	F	3/2	92	94.4	23.9	28.8	3.1	NT	116.	233.4	NT	74.6	241.1	2.39
87C0150	F	3/2	92	NT	NT	NT	NT	NT	115.	NT	NT	NT	NT	2.59
87C0152	F	3/2	92	NT	NT	NT	NT	NT	109.	NT	NT	NT	NT	2.41
87C0160	F	3/2	92	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	2.81
87C0163	F	3/2	92	167.0	18.6	273.8	3.0	NT	113.	268.3	NT	52.2	391.0	2.38
87C0167	F	3/2	92	290.9	31.9	433.6	3.0	NT	115.	309.6	NT	53.1	549.0	2.25
87C0173	F	3/2	92	NT	23.5	NT	NT	NT	119.	NT	NT	70.6	NT	2.64
87C0181	F	3/2	92	138.6	20.9	101.4	3.3	NT	114.	239.0	NT	73.6	322.0	2.40
PARAMETER MEANS:				153.72	26.40	191.22	3.00	0.03	114.44	253.46	285.00	64.37	374.48	2.47
STANDARD DEVIATIONS:				84.44	6.63	162.25	0.25	-	2.74	36.44	-	9.62	113.25	0.17
87C0120	F	4/2	92	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	2.50
87C0128	F	4/2	92	NT	26.1	NT	NT	NT	114.	NT	NT	70.8	NT	2.16
87C0139	F	4/2	92	NT	NT	NT	NT	NT	118.	254.2	NT	84.8	NT	2.19
87C0149	F	4/2	92	NT	19.9	NT	3.0	NT	114.	NT	NT	67.3	NT	2.33
87C0156	F	4/2	92	NT	21.5	NT	NT	NT	113.	NT	NT	79.3	NT	2.93
87C0157	F	4/2	92	NT	NT	NT	NT	NT	115.	NT	NT	62.0	NT	2.54
87C0180	F	4/2	92	NT	NT	NT	NT	NT	116.	NT	NT	NT	NT	2.44
87C0182	F	4/2	92	NT	NT	NT	NT	NT	110.	NT	NT	78.1	NT	2.81
PARAMETER MEANS:				-	22.50	-	3.00	-	114.29	254.20	-	73.72	-	2.49
STANDARD DEVIATIONS:				-	3.22	-	-	-	2.50	-	-	8.49	-	0.27

LETTERMAN ARMY INSTITUTE OF RESEARCH  
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Appendix K: SERUM CHEMISTRY  
STUDY NUMBER: 86007

STUDY START DATE: 01-APR-87  
MOUSE/ICR  
SUBCHRONIC/90 DAY FEEDING

ANIMAL NUMBER	SEX	GROUP/ SUBGROUP	DAY OF STUDY	NA	CAL	CHOL	CR	ALT	TP	URIC	K	TRIG	A-G
87C0114	F	1/2	92	154.7	8.5	NT	0.50	91.0	NT	NT	6.0	NT	NT
87C0116	F	1/2	92	158.2	8.5	NT	0.50	31.2	NT	NT	4.4	NT	NT
87C0117	F	1/2	92	158.3	8.5	78.6	0.40	39.1	4.7	0.9	5.7	92	1.1
87C0129	F	1/2	92	161.3	9.3	45.3	0.70	42.7	4.9	0.9	5.8	84	1.9
87C0135	F	1/2	92	159.5	8.8	NT	0.50	53.8	4.9	NT	6.1	NT	1.3
87C0140	F	1/2	92	159.3	9.0	47.7	0.90	34.9	4.7	0.6	5.3	85	1.6
87C0145	F	1/2	92	156.7	9.0	NT	0.40	30.1	NT	NT	6.2	NT	NT
87C0165	F	1/2	92	161.2	9.0	50.7	0.50	36.3	4.8	1.1	6.1	68	1.7
87C0168	F	1/2	92	162.3	9.7	NT	NT	NT	NT	NT	5.3	NT	NT
PARAMETER MEANS:				159.06	8.92	55.58	0.55	44.89	4.80	0.88	5.66	82.25	1.52
STANDARD DEVIATIONS:				2.40	0.41	15.51	0.17	20.08	0.10	0.21	0.58	10.14	0.32
87C0101	F	2/2	92	154.6	9.0	NT	NT	NT	NT	NT	5.8	NT	NT
87C0111	F	2/2	92	157.2	8.6	39.2	1.20	36.9	4.7	1.3	6.3	174	1.1
87C0121	F	2/2	92	156.8	8.6	59.8	0.40	31.7	4.7	3.1	4.9	62	1.5
87C0124	F	2/2	92	154	9.2	NT	NT	NT	NT	NT	6.4	NT	NT
87C0176	F	2/2	92	160.2	9.2	57.8	0.70	49.4	4.8	1.3	4.6	88	1.5
87C0143	F	2/2	92	152.9	8.9	NT	NT	NT	NT	NT	6.3	NT	NT
87C0144	F	2/2	92	160.5	9.1	NT	NT	NT	NT	NT	6.5	NT	NT
87C0155	F	2/2	92	158	8.6	61.5	0.40	31.8	5.0	4.8	5.4	161	1.4
87C0158	F	2/2	92	159.6	10.0	NT	0.50	55.6	5.1	NT	5.5	NT	1.3
PARAMETER MEANS:				157.09	9.02	54.58	0.64	41.08	4.86	2.63	5.74	121.25	1.36
STANDARD DEVIATIONS:				2.78	0.44	10.36	0.34	10.86	0.18	1.68	0.69	54.71	0.17

LETTERMAN ARMY INSTITUTE OF RESEARCH      Appendix K: SERUM CHEMISTRY      STUDY START DATE: 01-APR-87  
 DIV OF TOXICOLOGY      STUDY NUMBER: 86007      MOUSE/ICR  
 PRESIDIO OF SAN FRANCISCO, CA 94129      SUBCHRONIC/90 DAY FEEDING

ANIMAL NUMBER	SEX	GROUP/ SUBGROUP	DAY OF STUDY	NA	CAL	CHOL	CR	ALT	TP	URIC	K	TRIG	A-G
87C0105	F	3/2	92	156.3	8.6	32.3	1.00	22.9	4.6	1.9	5.1	134	1.3
87C0118	F	3/2	92	156.9	8.5	NT	1.40	50.7	NT	NT	6.7	NT	NT
87C0122	F	3/2	92	160.3	9.1	NT	0.30	61.7	5.3	NT	5.3	NT	1.4
87C0150	F	3/2	92	161.1	9.4	NT	NT	NT	NT	NT	6.9	NT	NT
87C0152	F	3/2	92	160.6	9.1	NT	NT	13.8	NT	NT	6.1	NT	NT
87C0160	F	3/2	92	159.1	9.7	NT	NT	NT	NT	NT	6.9	NT	NT
87C0163	F	3/2	92	161.3	9.3	NT	0.50	57.6	5.1	NT	5.0	NT	1.4
87C0167	F	3/2	92	160.3	9.5	44.6	0.80	77.6	4.9	1.6	6.2	81	1.6
87C0173	F	3/2	92	162.6	9.2	NT	0.40	40.9	NT	NT	8.4	NT	NT
87C0181	F	3/2	92	160.5	9.8	NT	0.40	25.9	5.5	0.3	5.6	NT	1.5
PARAMETER MEANS:				159.90	9.22	38.45	0.69	43.89	5.08	1.27	6.22	107.50	1.44
STANDARD DEVIATIONS:				1.96	0.42	8.70	0.40	21.93	0.35	0.85	1.05	37.48	0.11
87C0120	F	4/2	92	158.9	8.4	NT	NT	NT	NT	NT	5.2	NT	NT
87C0128	F	4/2	92	158.9	8.7	NT	0.50	30.4	NT	NT	5.0	NT	NT
87C0139	F	4/2	92	159.5	8.7	NT	NT	29.9	NT	NT	5.0	NT	NT
87C0149	F	4/2	92	159.5	8.7	NT	0.50	38.9	5.0	NT	4.9	NT	1.5
87C0156	F	4/2	92	161.2	9.7	NT	0.40	31.9	NT	NT	5.9	NT	NT
87C0157	F	4/2	92	161.8	9.2	NT	NT	45.9	NT	NT	5.8	NT	NT
87C0180	F	4/2	92	165.1	9.8	NT	NT	NT	NT	NT	6.7	NT	NT
87C0182	F	4/2	92	161.3	10.0	NT	NT	30.0	NT	NT	6.4	NT	NT
PARAMETER MEANS:				160.78	9.15	-	0.47	34.50	5.00	-	5.61	-	1.5
STANDARD DEVIATIONS:				2.09	0.61	-	0.06	6.55	-	-	0.69	-	-

**Appendix L: HEMATOLOGY**  
**List of Hematology Abbreviations/Units**

ATL	Atypical lymphocytes (%)
BAS	Basophils (%)
BLA	Blast (%)
EOS	Eosinophils (%)
HCT	Hematocrit (%)
HGB	Hemoglobin (g/dl)
LYM	Lymphocytes (%)
MCH	Mean Corpuscular Hemoglobin (picograms)
MCHC	Mean Corpuscular Hemoglobin Concentration (g/dl)
MCV	Mean Corpuscular Volume (femtoliters)
MON	Monocytes (%)
RBC	Erythrocytes ( $\times 10^6/\mu\text{l}$ )
SEG	Polymorphonuclear Granulocytes (%)
WBC	Total Leukocyte Count ( $\times 10^3/\mu\text{l}$ )



LETTERMAN ARMY INSTITUTE OF RESEARCH      Appendix L: HEMATOLOGY      STUDY START DATE: 01-APR-87  
 DIV OF TOXICOLOGY      STUDY NUMBER: 86007      MOUSE/ICR  
 PRESIDIO OF SAN FRANCISCO, CA 94129      SUBCHRONIC/90 DAY FEEDING

ANIMAL NUMBER	SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	WBC	RBC	HGB	HCT	MCV	MCH	MCHC
87C0037	M	1/1	13-May-87	NT	9.99	17.8	50.6	50	17.8	35.3
87C0041	M	1/1	13-May-87	1.7	8.07	14.1	38.6	48	17.6	36.6
87C0077	M	1/1	13-May-87	1.1	7.60	12.8	36.0	47	16.9	35.7
87C0079	M	1/1	13-May-87	1.1	7.56	13.0	35.7	47	17.3	36.6
87C0080	M	1/1	13-May-87	0.7	6.27	10.3	29.2	46	16.4	35.3
PARAMETER MEANS:				1.15	7.898	13.6	38.02	47.6	17.2	35.9
STANDARD DEVIATIONS:				0.412	1.347	2.729	7.84	1.517	0.5612	0.6595
87C0020	M	2/1	13-May-87	NT	6.77	11.8	32.0	47	17.5	37.0
87C0071	M	2/1	13-May-87	NT	8.62	14.6	39.7	46	17.0	36.8
87C0088	M	2/1	13-May-87	1.2	9.23	14.6	40.7	49	17.8	36.0
87C0090	M	2/1	13-May-87	NT	9.60	17.0	46.2	48	17.8	36.9
87C0098	M	2/1	13-May-87	1.1	9.24	15.6	43.7	47	17.0	35.8
PARAMETER MEANS:				1.15	9.492	14.72	40.46	47.4	17.42	36.5
STANDARD DEVIATIONS:				0.071	1.1	1.906	5.377	1.14	0.4025	0.5566
87C0033	M	3/1	13-May-87	7.1	5.46	8.8	25.4	47	16.3	34.6
87C0039	M	3/1	13-May-87	1.4	5.60	11.5	33.2	50	17.5	34.6
87C0049	M	3/1	13-May-87	1.0	6.59	11.7	33.4	50	17.8	35.1
87C0050	M	3/1	13-May-87	NT	8.10	14.5	40.0	49	17.9	36.3
87C0059	M	3/1	13-May-87	0.8	7.26	12.1	32.8	45	16.7	36.9
PARAMETER MEANS:				2.58	6.59	11.72	32.96	48.2	17.24	35.5
STANDARD DEVIATIONS:				3.027	1.332	2.028	5.172	2.168	0.7056	1.046
87C0025	M	4/1	13-May-87	3.3	8.04	15.1	40.8	51	18.8	37.1
87C0046	M	4/1	13-May-87	1.7	8.20	14.3	39.3	48	17.5	36.5
87C0054	M	4/1	13-May-87	1.4	7.78	14.3	39.5	51	18.3	36.2
87C0067	M	4/1	13-May-87	0.8	7.54	12.8	34.9	46	17.1	36.9
87C0072	M	4/1	13-May-87	2.2	6.92	15.9	43.7	49	17.9	36.4
PARAMETER MEANS:				1.88	7.696	14.48	39.64	49	17.92	36.62
STANDARD DEVIATIONS:				0.9418	0.5015	1.15	3.179	2.121	0.6648	0.3698

LETTERMAN ARMY INSTITUTE OF RESEARCH				Appendix L: HEMATOLOGY		STUDY START DATE: 01-APR-87			
DIV OF TOXICOLOGY				STUDY NUMBER: 86007		MOUSE/ICR			
PRESIDIO OF SAN FRANCISCO, CA 94129				SUBCHRONIC/90 DAY FEEDING					
ANIMAL NUMBER	SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	RBC	HGB	HCT	MCV	MCH	MCHC
87C0021	M	1/1	03-JUL-87	8.00	14.0	39.5	48.	17.3	35.5
87C0026	M	1/1	03-JUL-87	8.19	14.2	38.7	47.	17.5	36.9
87C0032	M	1/1	03-JUL-87	8.30	14.3	38.8	47.	17.3	36.9
87C0038	M	1/1	03-JUL-87	7.44	14.6	35.0	47.	19.6	41.6
87C0045	M	1/1	03-JUL-87	9.57	16.2	45.5	48.	17.1	35.7
87C0066	M	1/1	03-JUL-87	9.15	15.9	45.0	49.	17.5	35.4
87C0075	M	1/1	03-JUL-87	7.21	13.1	35.2	49.	18.2	37.1
87C0082	M	1/1	03-JUL-87	8.11	15.3	40.6	50.	19.0	37.7
87C0083	M	1/1	03-JUL-87	6.01	10.2	29.7	49.	17.0	34.3
87C0093	M	1/1	03-JUL-87	8.35	14.3	38.9	47.	17.2	36.7
PARAMETER MEANS:				8.033	14.21	38.69	48.1	17.77	36.72
STANDARD DEVIATIONS:				0.9964	1.684	4.681	1.101	0.882	1.974
87C0030	M	2/1	03-JUL-87	8.40	14.8	40.9	49.	17.7	36.3
87C0031	M	2/1	03-JUL-87	8.25	15.1	38.2	46.	18.3	39.5
87C0034	M	2/1	03-JUL-87	8.83	15.3	42.1	48.	17.4	36.4
87C0036	M	2/1	03-JUL-87	7.88	14.1	39.2	50.	18.0	35.9
87C0040	M	2/1	03-JUL-87	6.56	13.4	37.3	49.	17.8	36.0
87C0056	M	2/1	03-JUL-87	9.99	18.7	50.4	48.	17.9	37.1
87C0063	M	2/1	03-JUL-87	9.51	16.5	45.0	47.	17.4	36.6
87C0065	M	2/1	03-JUL-87	7.80	13.1	38.1	49.	16.8	34.4
87C0081	M	2/1	03-JUL-87	9.99	23.6	61.2	48.	18.4	38.7
87C0085	M	2/1	03-JUL-87	8.41	15.6	40.6	48.	19.7	40.9
PARAMETER MEANS:				8.562	16.12	43.3	48.2	17.94	37.18
STANDARD DEVIATIONS:				1.067	3.110	7.409	1.135	0.7749	1.944

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Appendix L: HEMATOLOGY  
STUDY NUMBER: 85007

STUDY START DATE: 01-APR-87  
MCUSE/ICR  
SUBCHRONIC/90 DAY FEEDING

ANIMAL NUMBER	SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	RBC	HGB	HCT	MCV	MCH	MCHC
87C0024	M	3/1	03-JUL-87	7.70	13.0	36.5	47.	16.9	35.6
87C0042	M	3/1	03-JUL-87	9.35	16.3	44.2	47.	17.6	37.0
87C0044	M	3/1	03-JUL-87	8.54	15.4	41.4	48.	18.1	37.2
87C0051	M	3/1	03-JUL-87	6.93	12.2	33.1	48.	17.6	35.8
87C0052	M	3/1	03-JUL-87	8.23	14.3	39.2	47.	17.4	35.6
87C0055	M	3/1	03-JUL-87	7.27	12.6	34.7	48.	17.4	35.3
87C0078	M	3/1	03-JUL-87	8.18	12.4	38.2	47.	15.3	32.5
87C0084	M	3/1	03-JUL-87	7.86	13.4	38.1	48.	17.1	35.1
87C0094	M	3/1	03-JUL-87	9.14	15.3	42.9	47.	16.8	35.6
87C0096	M	3/1	03-JUL-87	8.30	15.1	41.2	50.	18.3	36.7
PARAMETER MEANS:				8.15	14.0	38.95	47.7	17.25	35.94
STANDARD DEVIATIONS:				0.7566	1.467	3.557	0.9487	0.8343	1.389
87C0027	M	4/1	03-JUL-87	7.81	13.8	38.0	49.	17.7	35.3
87C0047	M	4/1	03-JUL-87	8.33	14.7	40.3	49.	17.7	35.6
87C0048	M	4/1	03-JUL-87	8.39	14.4	40.0	48.	17.2	35.9
87C0057	M	4/1	03-JUL-87	6.57	11.1	32.0	48.	16.8	34.7
87C0058	M	4/1	03-JUL-87	8.97	16.4	43.1	48.	18.3	35.0
87C0061	M	4/1	03-JUL-87	9.32	16.7	46.7	50.	18.0	35.9
87C0062	M	4/1	03-JUL-87	9.64	17.7	46.4	48.	19.4	36.1
87C0073	M	4/1	03-JUL-87	7.78	13.9	37.9	49.	17.9	35.7
87C0092	M	4/1	03-JUL-87	9.23	15.6	42.6	45.	16.9	35.6
87C0095	M	4/1	03-JUL-87	9.24	16.0	44.0	48.	17.3	36.3
PARAMETER MEANS:				8.528	15.03	41.10	48.2	17.62	35.50
STANDARD DEVIATIONS:				0.9443	1.880	4.455	1.033	0.5554	1.002

LETTERMAN ARMY INSTITUTE OF RESEARCH DIV OF TOXICOLOGY PRESIDIO OF SAN FRANCISCO, CA 94129				Appendix L: HEMATOLOGY STUDY NUMBER: 86007		STUDY START DATE: 01-APR-87 MOUSE/ICR SUBCHRONIC/90 DAY FEEDING					
ANIMAL NUMBER	SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	WBC	SEG	LYM	ATL	MON	EOS	BAS	BLA
87C0021	M	1/1	3-Jul-87	2.3	12	88	0	0	0	0	0
87C0026	M	1/1	3-Jul-87	1.2	12	88	0	0	0	0	0
87C0032	M	1/1	3-Jul-87	1.2	30	70	0	0	0	0	0
87C0038	M	1/1	3-Jul-87	1.1	18	82	0	0	0	0	0
87C0045	M	1/1	3-Jul-87	2.7	10	90	0	0	0	0	0
87C0066	M	1/1	3-Jul-87	1.7	38	62	0	0	0	0	0
87C0075	M	1/1	3-Jul-87	1.0	34	66	0	0	0	0	0
87C0082	M	1/1	3-Jul-87	1.4	10	90	0	0	0	0	0
87C0083	M	1/1	3-Jul-87	1.0	10	90	0	0	0	0	0
87C0093	M	1/1	3-Jul-87	NT	20	80	0	0	0	0	0
PARAMETER MEANS:				1.51	19.40	80.60	0	0	0	0	0
STANDARD DEVIATIONS:				0.609	10.79	10.79	0	0	0	0	0
87C0030	M	2/1	3-Jul-87	1.6	30	70	0	0	0	0	0
87C0031	M	2/1	3-Jul-87	NT	12	88	0	0	0	0	0
87C0034	M	2/1	3-Jul-87	1.7	14	86	0	0	0	0	0
87C0036	M	2/1	3-Jul-87	NT	10	90	0	0	0	0	0
87C0040	M	2/1	3-Jul-87	2.7	66	33	0	0	1	0	0
87C0056	M	2/1	3-Jul-87	1.6	12	88	0	0	0	0	0
87C0063	M	2/1	3-Jul-87	2.9	32	68	0	0	0	0	0
87C0065	M	2/1	3-Jul-87	2.9	30	70	0	0	0	0	0
87C0081	M	2/1	3-Jul-87	5.0	14	86	0	0	0	0	0
87C0085	M	2/1	3-Jul-87	2.7	14	86	0	0	0	0	0
PARAMETER MEANS:				2.64	23.40	76.5	0	0	0.1	0	0
STANDARD DEVIATIONS:				1.119	17.26	17.53	0	0	0.3162	0	0

LETTERMAN ARMY INSTITUTE OF RESEARCH      Appendix L: HEMATOLOGY      STUDY START DATE: 01-APR-87  
 DIV OF TOXICOLOGY      STUDY NUMBER: 86007      MOUSE/ICR  
 PRESIDIO OF SAN FRANCISCO, CA 94129      SUBCHRONIC/90 DAY FEEDING

ANIMAL NUMBER	SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	WBC	SEG	LYM	ATL	MON	EOS	BAS	BLA
87C0024	M	3/1	3-Jul-87	2.4	10	90	0	0	0	0	0
87C0042	M	3/1	3-Jul-87	NT	14	86	0	0	0	0	0
87C0044	M	3/1	3-Jul-87	1.9	8	92	0	0	0	0	0
87C0051	M	3/1	3-Jul-87	NT	26	74	0	0	0	0	0
87C0052	M	3/1	3-Jul-87	3.0	10	90	0	0	0	0	0
87C0055	M	3/1	3-Jul-87	0.9	6	94	0	0	0	0	0
87C0078	M	3/1	3-Jul-87	1.5	18	82	0	0	0	0	0
87C0084	M	3/1	3-Jul-87	1.0	16	84	0	0	0	0	0
87C0094	M	3/1	3-Jul-87	NT	14	86	0	0	0	0	0
87C0096	M	3/1	3-Jul-87	5.8	2	98	0	0	0	0	0
PARAMETER MEANS:											
				2.36	12.40	87.6	0	0	0	0	0
STANDARD DEVIATIONS:				1.692	6.786	6.786	0	0	0	0	0
87C0027	M	4/1	3-Jul-87	1.5	18	82	0	0	0	0	0
87C0047	M	4/1	3-Jul-87	2.3	42	58	0	0	0	0	0
87C0048	M	4/1	3-Jul-87	6.5	52	48	0	0	0	0	0
87C0057	M	4/1	3-Jul-87	0.9	18	82	0	0	0	0	0
87C0058	M	4/1	3-Jul-87	2.5	22	78	0	0	0	0	0
87C0061	M	4/1	3-Jul-87	2.5	20	80	0	0	0	0	0
87C0062	M	4/1	3-Jul-87	3.6	28	72	0	0	0	0	0
87C0073	M	4/1	3-Jul-87	2.8	14	86	0	0	0	0	0
87C0092	M	4/1	3-Jul-87	NT	18	92	0	0	0	0	0
87C0095	M	4/1	3-Jul-87	3.1	20	80	0	0	0	0	0
PARAMETER MEANS:											
				2.86	25.20	75.8	0	0	0	0	0
STANDARD DEVIATIONS:				1.586	12.26	13.28	0	0	0	0	0

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Appendix L: HEMATOLOGY  
 STUDY NUMBER: 86007

STUDY START DATE: 01-APR-87  
 MOUSE/ICR  
 SUBCHRONIC/90 DAY FEEDING

ANIMAL NUMBER	SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	RBC	HGB	HCT	MCV	MCH	MCHC
87C0114	F	1/2	03-JUL-87	9.96	17.8	48.3	49.	17.8	36.8
87C0116	F	1/2	03-JUL-87	7.08	12.1	33.7	47.	17.0	35.8
87C0117	F	1/2	03-JUL-87	7.34	12.4	35.1	48.	17.0	35.4
87C0129	F	1/2	03-JUL-87	7.96	13.7	38.1	48.	17.2	35.9
87C0135	F	1/2	03-JUL-87	8.64	15.6	41.8	48.	18.0	37.3
87C0140	F	1/2	03-JUL-87	9.18	16.4	45.4	49.	17.9	36.1
87C0145	F	1/2	03-JUL-87	8.63	15.8	42.2	49.	18.2	37.3
87C0165	F	1/2	03-JUL-87	9.99	18.1	49.7	49.	17.7	36.4
87C0168	F	1/2	03-JUL-87	8.93	16.6	45.9	51.	18.7	36.2
87C0178	F	1/2	03-JUL-87	8.37	15.0	42.0	50.	18.0	35.7
PARAMETER MEANS:									
STANDARD DEVIATIONS:				8.608	15.35	42.22	48.8	17.75	36.29
				0.9769	2.071	5.344	1.135	0.5462	0.6571
87C0101	F	2/2	03-JUL-87	9.59	17.0	46.3	48.	17.7	36.6
87C0111	F	2/2	03-JUL-87	8.99	15.9	43.6	49.	18.0	36.5
87C0121	F	2/2	03-JUL-87	5.58	9.9	27.0	48.	17.8	36.6
87C0124	F	2/2	03-JUL-87	8.92	15.9	43.6	49.	17.9	36.5
87C0176	F	2/2	03-JUL-87	8.62	15.7	42.5	49.	18.2	37.0
87C0134	F	2/2	03-JUL-87	8.61	15.7	42.6	49.	18.3	36.9
87C0143	F	2/2	03-JUL-87	9.27	16.3	43.6	47.	17.7	37.4
87C0144	F	2/2	03-JUL-87	8.55	14.7	40.8	48.	17.3	36.2
87C0155	F	2/2	03-JUL-87	9.82	17.8	49.0	50.	18.2	36.3
87C0158	F	2/2	03-JUL-87	7.99	19.9	53.1	50.	18.8	37.5
PARAMETER MEANS:									
STANDARD DEVIATIONS:				8.584	15.88	43.21	48.7	17.99	36.75
				1.183	2.549	6.756	0.9486	0.4121	0.4404

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Appendix L: HEMATOLOGY  
STUDY NUMBER: 86007

STUDY START DATE: 01-APR-87  
MOUSE/ICR  
SUBCHRONIC/90 DAY FEEDING

ANIMAL NUMBER	GROUP/ SEX SUBGROUP	DATE DATA TAKEN	RBC	HGB	HCT	MCV	MCH	MCHC
87C0105	F 3/2	03-JUL-87	8.45	14.4	39.9	47.	17.1	36.0
87C0118	F 3/2	03-JUL-87	8.41	14.3	39.4	47.	17.0	36.2
87C0122	F 3/2	03-JUL-87	9.52	15.8	43.2	45.	16.7	36.6
87C0150	F 3/2	03-JUL-87	8.08	14.9	41.0	51.	18.5	36.4
87C0152	F 3/2	03-JUL-87	7.57	14.9	40.6	47.	17.4	36.7
87C0160	F 3/2	03-JUL-87	9.99	19.0	52.3	51.	18.3	36.3
87C0163	F 3/2	03-JUL-87	8.55	15.7	43.1	50.	18.4	36.4
87C0167	F 3/2	03-JUL-87	8.52	15.6	43.3	51.	18.4	36.0
87C0173	F 3/2	03-JUL-87	8.21	15.0	40.3	49.	18.4	37.3
87C0181	F 3/2	03-JUL-87	8.92	16.3	44.6	50.	18.3	36.7
PARAMETER MEANS:								
STANDARD DEVIATIONS:			0.7013	1.357	3.775	48.8	17.85	36.46
						2.15	0.7106	0.3894
87C0120	F 4/2	03-JUL-87	8.77	15.4	41.2	47.	17.6	37.4
87C0128	F 4/2	03-JUL-87	9.99	18.6	51.4	49.	18.0	36.3
87C0139	F 4/2	03-JUL-87	9.00	15.7	44.8	50.	17.5	34.9
87C0149	F 4/2	03-JUL-87	8.37	15.0	41.5	50.	17.9	36.1
87C0154	F 4/2	03-JUL-87	8.53	14.6	40.7	48.	17.2	35.9
87C0156	F 4/2	03-JUL-87	8.50	15.8	41.9	49.	18.6	37.6
87C0157	F 4/2	03-JUL-87	7.09	12.8	35.3	50.	18.1	36.1
87C0174	F 4/2	03-JUL-87	9.99	18.5	49.7	48.	17.8	37.3
87C0180	F 4/2	03-JUL-87	9.99	19.6	53.7	50.	18.2	36.6
87C0182	F 4/2	03-JUL-87	9.99	17.4	47.4	47.	17.4	36.6
PARAMETER MEANS:								
STANDARD DEVIATIONS:			0.9709	2.120	5.704	48.8	17.83	36.48
						1.229	0.4193	0.8133

LETTERMAN ARMY INSTITUTE OF RESEARCH DIV OF TOXICOLOGY PRESIDIO OF SAN FRANCISCO, CA 94129				Appendix L: HEMATOLOGY STUDY NUMBER: 86007			STUDY START DATE: 01-APR-87 SUBCHRONIC/90 DAY FEEDING MOUSE/ICR				
ANIMAL NUMBER	SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	WBC	SEG	LYM	ATL	MON	EOS	BAS	BLA
87C0114	F	1/2	3-Jul-87	2.8	24	76	0	0	0	0	0
87C0116	F	1/2	3-Jul-87	1.1	14	86	0	0	0	0	0
87C0117	F	1/2	3-Jul-87	0.5	14	86	0	0	0	0	0
87C0129	F	1/2	3-Jul-87	0.9	24	76	0	0	0	0	0
87C0135	F	1/2	3-Jul-87	1.0	22	78	0	0	0	0	0
87C0140	F	1/2	3-Jul-87	1.3	20	80	0	0	0	0	0
87C0145	F	1/2	3-Jul-87	1.6	20	80	0	0	0	0	0
87C0165	F	1/2	3-Jul-87	1.2	22	78	0	0	0	0	0
87C0168	F	1/2	3-Jul-87	1.6	14	86	0	0	0	0	0
87C0178	F	1/2	3-Jul-87	1.0	30	70	0	0	0	0	0
PARAMETER MEANS:				1.3	20.40	79.6	0	0	0	0	0
STANDARD DEVIATIONS:				0.62	5.232	5.232	0	0	0	0	0
87C0101	F	2/2	3-Jul-87	2.3	20	80	0	0	0	0	0
87C0111	F	2/2	3-Jul-87	1.8	12	88	0	0	0	0	0
87C0121	F	2/2	3-Jul-87	0.7	14	86	0	0	0	0	0
87C0124	F	2/2	3-Jul-87	0.7	24	76	0	0	0	0	0
87C0176	F	2/2	3-Jul-87	2.3	10	90	0	0	0	0	0
87C0134	F	2/2	3-Jul-87	1.2	36	64	0	0	0	0	0
87C0143	F	2/2	3-Jul-87	1.1	34	66	0	0	0	0	0
87C0144	F	2/2	3-Jul-87	1.3	10	90	0	0	0	0	0
87C0155	F	2/2	3-Jul-87	2.0	18	82	0	0	0	0	0
87C0158	F	2/2	3-Jul-87	2.0	22	78	0	0	0	0	0
PARAMETER MEANS:				1.54	20.00	80	0	0	0	0	0
STANDARD DEVIATIONS:				0.6168	9.286	9.286	0	0	0	0	0



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Appendix L: HEMATOLOGY  
STUDY NUMBER: 86007

STUDY START DATE: 01-APR-87  
MOUSE/ICR  
SUBCHRONIC/90 DAY FEEDING

ANIMAL NUMBER	SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	WBC	SEG	LYM	ATL	MON	EOS	BAS	BLA
87C0105	F	3/2	3-Jul-87	2.0	42	58	0	0	0	0	0
87C0118	F	3/2	3-Jul-87	0.8	16	84	0	0	0	0	0
87C0122	F	3/2	3-Jul-87	2.6	18	82	0	0	0	0	0
87C0150	F	3/2	3-Jul-87	1.1	36	64	0	0	0	0	0
87C0152	F	3/2	3-Jul-87	1.2	10	90	0	0	0	0	0
87C0160	F	3/2	3-Jul-87	2.1	10	90	0	0	0	0	0
87C0163	F	3/2	3-Jul-87	1.4	20	80	0	0	0	0	0
87C0167	F	3/2	3-Jul-87	1.3	14	86	0	0	0	0	0
87C0173	F	3/2	3-Jul-87	1.4	20	80	0	0	0	0	0
87C0181	F	3/2	3-Jul-87	1.2	22	78	0	0	0	0	0
PARAMETER MEANS:											
				1.51	20.80	79.2	0	0	0	0	0
STANDARD DEVIATIONS:				0.5486	10.51	10.51	0	0	0	0	0
87C0120	F	4/2	3-Jul-87	1.4	18	82	0	0	0	0	0
87C0128	F	4/2	3-Jul-87	1.3	34	66	0	0	0	0	0
87C0139	F	4/2	3-Jul-87	1.2	22	78	0	0	0	0	0
87C0149	F	4/2	3-Jul-87	0.9	22	78	0	0	0	0	0
87C0154	F	4/2	3-Jul-87	1.0	32	68	0	0	0	0	0
87C0156	F	4/2	3-Jul-87	1.8	28	72	0	0	0	0	0
87C0157	F	4/2	3-Jul-87	0.8	14	86	0	0	0	0	0
87C0174	F	4/2	3-Jul-87	2.5	18	82	0	0	0	0	0
87C0180	F	4/2	3-Jul-87	3.8	18	82	0	0	0	0	0
87C0182	F	4/2	3-Jul-87	NT	12	88	0	0	0	0	0
PARAMETER MEANS:											
				1.63	21.80	78.2	0	0	0	0	0
STANDARD DEVIATIONS:				0.966	7.391	7.391	0	0	0	0	0

## Appendix M: ORGAN WEIGHTS

LETTERMAN ARMY INSTITUTE OF RESEARCH DIV OF RES SUPP, PATH SERV GP PRESIDIO OF SAN FRANCISCO, CA 94129 SPECIES: MOUSE/ICR				SUMMARY STATISTICS FOR ABSOLUTE ORGAN WEIGHTS (GMS) STUDY NUMBER: GLP86007 REPORT FOR INTERIM SACRIFICE NUMBER (ALL SUBGROUPS) STUDY START DATE: 01-APR-87				PRINTED: 13-SEP-88 PAGE: 1		STUDY TYPE:	
ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	BRAIN	LIVER	KIDNEY	HEART	SPLEEN	ADRENAL	OVARIES	TESTES	
37/M	1/1	34.00	0.522	1.795	0.569	0.225	0.096			0.263	
41/M	1/1	38.00	0.479	1.941	0.601	0.183	0.117			0.321	
77/M	1/1	37.00	0.518	2.150	0.618	0.211	0.139			0.308	
79/M	1/1	39.00	0.470	1.999	0.424	0.149	0.112			0.279	
80/M	1/1	38.00	0.526	1.934	0.543	0.187	0.096			0.319	
		M E A N:	0.503	1.964	0.551	0.191	0.112			0.298	
		STANDARD DEVIATION:	0.026	0.128	0.077	0.029	0.018			0.026	
20/M	2/1	33.00	0.528	2.004	0.489	0.157	0.110			0.282	
71/M	2/1	38.00	0.483	1.912	0.608	0.176	0.096			0.249	
88/M	2/1	35.00	0.516	1.882	0.585	0.185	0.114			0.260	
90/M	2/1	41.00	0.474	1.321	0.575	0.226	0.094			0.294	
98/M	2/1	32.00	0.488	1.558	0.427	0.147	0.112			0.290	
		M E A N:	0.498	1.735	0.537	0.178	0.105			0.275	
		STANDARD DEVIATION:	0.023	0.286	0.076	0.031	0.009			0.020	
33/M	3/1	35.00	0.465	2.196	0.424	0.220	0.405			0.254	
39/M	3/1	40.00	0.452	2.088	0.505	0.218	0.104			0.243	
49/M	3/1	37.00	0.469	2.166	0.481	0.193	0.088			0.225	
50/M	3/1	33.00	0.452	1.914	0.478	0.200	0.080			0.249	
59/M	3/1	34.00	0.552	1.943	0.493	0.171	0.092			0.311	
		M E A N:	0.478	2.061	0.476	0.200	0.154			0.256	
		STANDARD DEVIATION:	0.042	0.128	0.031	0.020	0.141			0.032	
25/M	4/1	33.00	0.503	1.930	0.489	0.198	0.115			0.248	
46/M	4/1	32.00	0.548	1.613	0.468	0.179	0.073			0.296	
54/M	4/1	33.00	0.506	1.974	0.544	0.244	0.095			0.285	
67/M	4/1	37.00	0.568	1.895	0.560	0.190	0.114			0.307	
72/M	4/1	31.00	0.562	1.828	0.416	0.206	0.117			0.252	
		M E A N:	0.537	1.848	0.495	0.203	0.103			0.278	
		STANDARD DEVIATION:	0.031	0.142	0.058	0.025	0.019			0.026	

## Appendix M (cont.): ORGAN WEIGHTS

LETTERMAN ARMY INSTITUTE OF RESEARCH			SUMMARY STATISTICS FOR ABSOLUTE ORGAN WEIGHTS (GMS)							PRINTED: 13-SEP-88	
DIV OF RES SUPP, PATH SERV GP			STUDY NUMBER: GLP86007							PAGE: 1	
PRESIDIO OF SAN FRANCISCO, CA 94129			REPORT FOR INTERIM SACRIFICE NUMBER (ALL SUBGROUPS)								
SPECIES: MOUSE/ICR			STUDY START DATE: 01-APR-87							STUDY TYPE:	
ANIMAL NO/SEX	GROUP/SUBGROUP	TERMINAL BODY WT. GMS	BRAIN	LIVER	KIDNEY	HEART	SPLEEN	ADRENAL	OVARIES	TESTES	
126/F	1/2	28.00	0.513	1.497	0.358	0.153	0.099		0.047		
130/F	1/2	29.00	0.536	1.665	0.396	0.160	0.120		0.385		
151/F	1/2	29.00	0.571	1.452	0.355	0.214	0.094		0.048		
153/F	1/2	29.00	0.467	1.606	0.398	0.126	0.116		0.018		
161/F	1/2	27.00	0.502	1.320	0.356	0.138	0.112		0.038		
		M E A N:	0.518	1.508	0.373	0.158	0.108		0.107		
		STANDARD DEVIATION:	0.039	0.135	0.022	0.034	0.011		0.156		
99/F	2/2	29.00	0.527	1.612	0.380	0.141	0.135		0.016		
146/F	2/2	28.00	0.516	1.432	0.390	0.167	0.102		0.051		
169/F	2/2	28.00	0.545	1.455	0.360	0.179	0.102		0.049		
171/F	2/2	28.00	0.512	1.354	0.368	0.144	0.082		0.021		
175/F	2/2	27.00	0.482	1.353	0.347	0.181	0.090		0.028		
		M E A N:	0.516	1.441	0.369	0.162	0.102		0.033		
		STANDARD DEVIATION:	0.023	0.106	0.017	0.019	0.020		0.016		
109/F	3/2	32.00	0.555	1.828	0.344	0.137	0.170		0.059		
112/F	3/2	26.00	0.506	1.285	0.366	0.152	0.100		0.054		
125/F	3/2	27.00	0.526	1.306	0.367	0.149	0.113		0.053		
132/F	3/2	26.00	0.329	1.010	0.406	0.053	0.098		0.046		
162/F	3/2	25.00	0.512	1.185	0.371	0.164	0.113		0.028		
		M E A N:	0.486	1.323	0.371	0.131	0.119		0.048		
		STANDARD DEVIATION:	0.090	0.306	0.022	0.045	0.029		0.012		
107/F	4/2	26.00	0.527	1.179	0.337	0.155	0.148		0.058		
127/F	4/2	27.00	0.481	1.427	0.357	0.137	0.103		0.039		
148/F	4/2	29.00	0.566	1.624	0.167	0.179	0.130		0.045		
164/F	4/2	27.00	0.549	1.299	0.348	0.138	0.091		0.049		
166/F	4/2	29.00	0.545	1.528	0.341	0.148	0.117		0.025		
		M E A N:	0.534	1.411	0.310	0.151	0.118		0.043		
		STANDARD DEVIATION:	0.033	0.177	0.080	0.017	0.022		0.012		

## Appendix M (cont.): ORGAN WEIGHTS

LETTERMAN ARMY INSTITUTE OF RESEARCH  
 DIV OF RES SUPP, PATH SERV GP  
 PRESIDIO OF SAN FRANCISCO, CA 94129  
 SPECIES: MOUSE/ICR

SUMMARY STATISTICS FOR ABSOLUTE ORGAN WEIGHTS (GMS)  
 STUDY NUMBER: GLP86007  
 REPORT FOR FINAL SACRIFIC (ALL SUBGROUPS)  
 STUDY START DATE: 01-APR-87

PRINTED: 13-SEP-88  
 PAGE: 1  
 STUDY TYPE:

ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	BRAIN	LIVER	KIDNEY	HEART	SPLEEN	ADRENAL	OVARIES	TESTES
21/M	1/1	33.00	0.485	1.875	0.467	0.184	0.094			0.260
26/M	1/1	40.00	0.496	2.038	0.613	0.219	0.106			0.279
32/M	1/1	46.00	0.506	2.898	0.715	0.253	0.133			0.299
38/M	1/1	42.00	0.522	2.309	0.767	0.215	0.120			0.279
45/M	1/1	39.00	0.537	2.269	0.558	0.170	0.079			0.244
66/M	1/1	35.00	0.447	1.412	0.582	0.262	0.088			0.287
75/M	1/1	47.00	0.508	2.341	0.744	0.218	0.114			0.318
82/M	1/1	40.00	0.512	1.730	0.682	0.307	0.095			0.274
83/M	1/1	44.00	0.534	2.247	0.651	0.198	0.126			0.298
93/M	1/1	47.00	0.527	2.356	0.723	0.228	0.121			0.287
M E A N:			0.507	2.148	0.650	0.225	0.108			0.282
STANDARD DEVIATION:			0.027	0.408	0.095	0.040	0.018			0.021

30/M	2/1	35.00	0.501	2.025	0.492	0.229	0.078			0.248
31/M	2/1	37.00	0.539	1.902	0.550	0.166	0.138			0.313
34/M	2/1	39.00	0.521	2.155	0.669	0.206	0.106			0.313
36/M	2/1	36.00	0.468	1.858	0.571	0.178	0.102			0.308
40/M	2/1	38.00	0.544	2.011	0.645	0.179	0.093			0.350
56/M	2/1	36.00	0.526	1.806	0.601	0.243	0.096			0.265
63/M	2/1	41.00	2.729	2.121	0.665	0.197	0.130			0.262
65/M	2/1	45.00	0.544	2.390	0.708	0.266	0.153			0.326
81/M	2/1	38.00	0.497	1.900	0.522	0.207	0.112			0.364
85/M	2/1	43.00	0.532	2.150	0.792	0.240	0.142			0.368
M E A N:			0.740	2.032	0.622	0.211	0.115			0.312
STANDARD DEVIATION:			0.699	0.177	0.092	0.033	0.024			0.043

24/M	3/1	34.00	0.584	1.925	0.611	0.040	0.079			0.244
42/M	3/1	36.00	0.530	1.931	0.520	0.163	0.102			0.253
44/M	3/1	43.00	0.460	2.315	0.701	0.214	0.102			0.236
51/M	3/1	44.00	0.519	2.440	0.732	0.241	0.099			0.283
52/M	3/1	42.00	0.505	2.321	0.637	0.207	0.161			0.243
55/M	3/1	38.00	0.480	2.096	0.613	0.213	0.086			0.237
78/M	3/1	42.00	0.465	2.236	0.675	0.207	0.112			0.302
84/M	3/1	38.00	0.568	1.874	0.670	0.186	0.132			0.341
94/M	3/1	38.00	0.548	1.718	0.638	0.242	0.118			0.298
96/M	3/1	39.00	0.532	1.801	0.501	0.171	0.089			0.286
M E A N:			0.519	2.066	0.630	0.188	0.108			0.272
STANDARD DEVIATION:			0.042	0.250	0.073	0.058	0.024			0.035

## Appendix M (cont.): ORGAN WEIGHTS

LETTERMAN ARMY INSTITUTE OF RESEARCH				SUMMARY STATISTICS FOR ABSOLUTE ORGAN WEIGHTS (GMS)					PRINTED: 13-SEP-88	
DIV OF RES SUPP, PATH SERV GP				STUDY NUMBER: GLP86007					PAGE: 2	
PRESIDIO OF SAN FRANCISCO, CA 94129				REPORT FOR FINAL SACRIFIC (ALL SUBGROUPS)						
SPECIES: MOUSE/ICR				STUDY START DATE: 01-APR-87					STUDY TYPE:	
ANIMAL NO/SEX	GROUP/SUBGROUP	TERMINAL BODY WT. GMS	BRAIN	LIVER	KIDNEY	HEART	SPLEEN	ADRENAL	OVARIES	TESTES
27/M	4/1	36.00	0.508	2.029	0.112	0.176	0.089			0.264
47/M	4/1	39.00	0.576	2.017	0.673	0.185	0.161			0.376
48/M	4/1	40.00	0.516	2.261	0.648	0.195	0.243			2.156
57/M	4/1	40.00	0.583	2.165	0.659	0.149	0.094			0.309
58/M	4/1	42.00	0.558	2.140	0.685	0.222	0.125			0.348
61/M	4/1	42.00	0.500	2.015	0.584	0.177	0.078			0.302
62/M	4/1	39.00	0.580	2.211	0.573	0.215	0.079			0.284
73/M	4/1	37.00	0.518	1.990	0.567	0.183	0.136			0.283
92/M	4/1	40.00	0.528	2.102	0.644	0.172	0.123			0.263
95/M	4/1	41.00	0.489	1.652	0.550	0.194	0.096			0.299
MEAN:			0.536	2.058	0.570	0.187	0.122			0.488
STANDARD DEVIATION:			0.035	0.169	0.168	0.021	0.050			0.587

## Appendix M (cont.): ORGAN WEIGHTS

LETTERMAN ARMY INSTITUTE OF RESEARCH  
 DIV OF RES SUPP, PATH SERV GP  
 PRESIDIO OF SAN FRANCISCO, CA 94129  
 SPECIES: MOUSE/ICR

PRINTED: 13-SEP-88  
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SUMMARY STATISTICS FOR ABSOLUTE ORGAN WEIGHTS (GMS)  
 STUDY NUMBER: GLP86007  
 REPORT FOR FINAL SACRIFIC (ALL SUBGROUPS)  
 STUDY START DATE: 01-APR-87

STUDY TYPE:

ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	BRAIN	LIVER	KIDNEY	HEART	SPLEEN	ADRENAL	OVARIES	TESTES
114/F	1/2	31.00	0.473	1.696	0.444	0.139	0.139	0.048	0.048	
116/F	1/2	27.00	0.561	1.478	0.466	0.139	0.100	0.059	0.059	
117/F	1/2	28.00	0.505	1.506	0.373	0.154	0.105	0.058	0.058	
129/F	1/2	33.00	0.564	1.648	0.407	0.193	0.125	0.081	0.081	
135/F	1/2	29.00	0.541	1.432	0.431	0.180	0.127	0.004	0.004	
140/F	1/2	27.00	0.512	1.541	0.404	0.156	0.132	0.030	0.030	
145/F	1/2	36.00	0.428	1.664	0.511	0.155	0.106	0.050	0.050	
145/F	1/2	31.00	0.453	1.453	0.343	0.138	0.074	0.037	0.037	
165/F	1/2	30.00	0.494	1.662	0.412	0.132	0.137	0.020	0.020	
168/F	1/2	30.00	0.501	1.343	0.365	0.137	0.131	0.016	0.016	
178/F	1/2	30.00	0.503	1.542	0.416	0.152	0.118	0.040	0.040	
MEAN:			0.504	0.120	0.050	0.020	0.021	0.023	0.023	
STANDARD DEVIATION:			0.044	0.120	0.050	0.020	0.021	0.023	0.023	
101/F	2/2	28.00	0.510	1.551	0.437	0.202	0.126	0.054	0.054	
111/F	2/2	32.00	0.527	1.543	0.289	0.130	0.083	0.041	0.041	
121/F	2/2	28.00	0.664	1.639	0.471	0.172	0.100	0.040	0.040	
124/F	2/2	29.00	0.520	1.429	0.421	0.151	0.117	0.045	0.045	
133/F	2/2	26.00	0.535	1.893	0.437	0.088	0.117	0.045	0.045	
134/F	2/2	28.00	0.509	1.677	0.403	0.164	0.092	0.059	0.059	
143/F	2/2	27.00	0.543	1.381	0.335	0.190	0.086	0.042	0.042	
143/F	2/2	31.00	0.473	1.628	0.397	0.153	0.048	0.027	0.027	
144/F	2/2	32.00	0.556	1.722	0.402	0.138	0.141	0.026	0.026	
155/F	2/2	32.00	0.550	1.702	0.385	0.142	0.101	0.020	0.020	
158/F	2/2	33.00	0.539	1.617	0.398	0.153	0.101	0.040	0.040	
MEAN:			0.505	0.149	0.053	0.032	0.026	0.012	0.012	
STANDARD DEVIATION:			0.050	0.149	0.053	0.032	0.026	0.012	0.012	
105/F	3/2	29.00	0.493	1.682	0.372	0.208	0.110	0.073	0.073	
118/F	3/2	31.00	0.537	1.751	0.451	0.170	0.105	0.060	0.060	
122/F	3/2	28.00	0.479	1.390	0.317	0.106	0.103	0.040	0.040	
150/F	3/2	28.00	0.590	1.426	0.446	0.175	0.150	0.079	0.079	
152/F	3/2	29.00	0.456	1.573	0.393	0.098	0.122	0.045	0.045	
160/F	3/2	30.00	0.334	1.427	0.320	0.147	0.079	0.012	0.012	
163/F	3/2	31.00	0.571	1.313	0.410	0.145	0.102	0.036	0.036	
167/F	3/2	30.00	0.592	1.343	0.407	0.164	0.086	0.027	0.027	
173/F	3/2	29.00	0.502	1.196	0.338	0.155	0.058	0.014	0.014	
181/F	3/2	30.00	0.497	1.519	0.406	0.147	0.062	0.024	0.024	
MEAN:			0.505	1.462	0.387	0.152	0.098	0.041	0.041	
STANDARD DEVIATION:			0.077	0.171	0.049	0.032	0.028	0.023	0.023	

## Appendix M (cont.): ORGAN WEIGHTS

LETTERMAN ARMY INSTITUTE OF RESEARCH  
DIV OF RES SUPP, PATH SERV GP  
PRESIDIO OF SAN FRANCISCO, CA 94129  
SPECIES: MOUSE/ICR

**SUMMARY STATISTICS FOR ABSOLUTE ORGAN WEIGHTS (GMS)**  
**STUDY NUMBER: GLP86007**  
**REPORT FOR FINAL SACRIFIC (ALL SUBGROUPS)**  
**STUDY START DATE: 01-APR-87**

PRINTED: 13-SEP-88  
PAGE: 2

### STUDY TYPE:

ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	BRAIN	LIVER	KIDNEY	HEART	SPLEEN	ADRENAL	OVARIES	TESTES
120/F	4/2	27.00	0.508	1.868	0.403	0.161	0.095		0.040	
128/F	4/2	27.00	0.534	1.414	0.408	0.160	1.424		0.060	
139/F	4/2	27.00	0.553	1.258	0.404	0.180	0.134		0.019	
149/F	4/2	26.00	0.515	1.472	0.336	0.145	0.141		0.024	
154/F	4/2	29.00	0.556	1.416	0.389	0.174	0.143		0.035	
156/F	4/2	30.00	0.520	1.711	0.366	0.199	0.121		0.046	
157/F	4/2	30.00	0.493	1.623	0.382	0.173	0.109		0.048	
174/F	4/2	29.00	0.504	1.383	0.316	0.069	0.069		0.024	
180/F	4/2	26.00	0.530	1.167	0.350	0.107	0.082		0.013	
182/F	4/2	31.00	0.603	1.366	0.399	0.160	0.123		0.035	
		M E A N:	0.532	1.468	0.375	0.158	0.244		0.034	
		STANDARD DEVIATION:	0.032	0.211	0.032	0.028	0.415		0.015	

## Appendix N: ORGAN-TO-BODY WEIGHT RATIO

LETTERMAN ARMY INSTITUTE OF RESEARCH  
 DIV OF RES SUPP, PATH SERV GP  
 PRESIDIO OF SAN FRANCISCO, CA 94129  
 SPECIES: MOUSE/ICR

PRINTED: 13-SEP-88  
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SUMMARY STATISTICS FOR % ORGAN TO BODY WEIGHT RATIO  
 STUDY NUMBER: GLP86007  
 REPORT FOR INTERIM SACRIFICE NUMBER (ALL SUBGROUPS)  
 STUDY START DATE: 01-APR-87

STUDY TYPE:

ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	BRAIN	LIVER	KIDNEY	HEART	SPLEEN	ADRENAL	OVARIES	TESTES
37/M	1/1	34.00	1.535	5.279	1.674	0.662	0.282			0.774
41/M	1/1	38.00	1.261	5.108	1.582	0.482	0.308			0.845
77/M	1/1	37.00	1.400	5.811	1.670	0.570	0.376			0.832
79/M	1/1	39.00	1.205	5.126	1.087	0.382	0.287			0.715
80/M	1/1	38.00	1.384	5.089	1.429	0.492	0.253			0.839
M E A N:			1.357	5.283	1.488	0.518	0.301			0.801
STANDARD DEVIATION:			0.129	0.305	0.245	0.105	0.046			0.056
20/M	2/1	33.00	1.600	6.073	1.482	0.476	0.333			0.855
71/M	2/1	38.00	1.271	5.032	1.600	0.463	0.253			0.655
88/M	2/1	35.00	1.474	5.377	1.671	0.529	0.326			0.743
90/M	2/1	41.00	1.156	3.222	1.402	0.551	0.229			0.717
98/M	2/1	32.00	1.525	4.869	1.334	0.459	0.350			0.906
M E A N:			1.405	4.914	1.498	0.496	0.298			0.775
STANDARD DEVIATION:			0.185	1.053	0.138	0.042	0.054			0.103
33/M	3/1	35.00	1.329	6.274	1.211	0.629	1.157			0.726
39/M	3/1	40.00	1.130	5.220	1.263	0.545	0.260			0.607
49/M	3/1	37.00	1.268	5.854	1.300	0.522	0.238			0.608
50/M	3/1	33.00	1.370	5.800	1.448	0.606	0.242			0.755
59/M	3/1	34.00	1.624	5.715	1.450	0.503	0.271			0.915
M E A N:			1.344	5.773	1.334	0.561	0.434			0.722
STANDARD DEVIATION:			0.181	0.377	0.109	0.054	0.405			0.127
25/M	4/1	33.00	1.524	5.848	1.482	0.600	0.348			0.752
46/M	4/1	32.00	1.712	5.041	1.462	0.559	0.228			0.925
54/M	4/1	33.00	1.533	5.982	1.648	0.739	0.288			0.864
67/M	4/1	37.00	1.535	5.122	1.514	0.514	0.308			0.830
72/M	4/1	31.00	1.813	5.897	1.342	0.665	0.377			0.813
M E A N:			1.624	5.578	1.490	0.615	0.310			0.837
STANDARD DEVIATION:			0.132	0.457	0.110	0.089	0.057			0.064



## Appendix N (cont.): ORGAN-TO-BODY WEIGHT RATIO

LETTERMAN ARMY INSTITUTE OF RESEARCH  
 DIV OF RES SUPP, PATH SERV GP  
 PRESIDIO OF SAN FRANCISCO, CA 94129  
 SPECIES: MOUSE/ICR

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SUMMARY STATISTICS FOR X ORGAN TO BODY WEIGHT RATIO  
 STUDY NUMBER: GLP86007  
 REPORT FOR INTERIM SACRIFICE NUMBER (ALL SUBGROUPS)  
 STUDY START DATE: 01-APR-87

STUDY TYPE:

ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT.	GMS	BRAIN	LIVER	KIDNEY	HEART	SPLEEN	ADRENAL	OVARIES	TESTES
126/F	1/2	28.00	1.832	5.346	1.279	0.546	0.354	0.168			
130/F	1/2	29.00	1.848	5.741	1.366	0.552	0.414	1.328			
151/F	1/2	29.00	1.969	5.007	1.224	0.738	0.324	0.166			
153/F	1/2	29.00	1.610	5.538	1.372	0.434	0.400	0.062			
161/F	1/2	27.00	1.859	4.889	1.319	0.511	0.415	0.141			
		M E A N:	1.824	5.304	1.312	0.556	0.381	0.373			
		STANDARD DEVIATION:	0.131	0.357	0.062	0.112	0.041	0.535			
99/F	2/2	29.00	1.817	5.559	1.310	0.486	0.466	0.055			
146/F	2/2	28.00	1.843	5.114	1.393	0.596	0.364	0.182			
169/F	2/2	28.00	1.946	5.196	1.286	0.639	0.364	0.175			
171/F	2/2	28.00	1.829	4.836	1.314	0.514	0.293	0.075			
175/F	2/2	27.00	1.785	5.011	1.285	0.670	0.333	0.104			
		M E A N:	1.844	5.143	1.318	0.581	0.364	0.118			
		STANDARD DEVIATION:	0.061	0.268	0.044	0.079	0.064	0.058			
109/F	3/2	32.00	1.734	5.712	1.075	0.428	0.531	0.184			
112/F	3/2	26.00	1.946	4.942	1.408	0.585	0.385	0.208			
125/F	3/2	27.00	1.948	4.837	1.359	0.552	0.419	0.196			
132/F	3/2	26.00	1.265	3.885	1.562	0.204	0.377	0.177			
162/F	3/2	25.00	2.048	4.740	1.484	0.656	0.452	0.112			
		M E A N:	1.788	4.823	1.377	0.485	0.433	0.175			
		STANDARD DEVIATION:	0.314	0.651	0.186	0.177	0.063	0.037			
107/F	4/2	26.00	2.027	4.535	1.296	0.596	0.569	0.223			
127/F	4/2	27.00	1.781	5.285	1.322	0.507	0.381	0.144			
148/F	4/2	29.00	1.952	5.600	0.576	0.617	0.448	0.155			
164/F	4/2	27.00	2.033	4.811	1.289	0.511	0.337	0.181			
166/F	4/2	29.00	1.879	5.269	1.176	0.510	0.403	0.086			
		M E A N:	1.935	5.100	1.132	0.548	0.428	0.158			
		STANDARD DEVIATION:	0.106	0.423	0.316	0.054	0.089	0.050			

## Appendix N (cont.): ORGAN-TO-BODY WEIGHT RATIO

LETTERMAN ARMY INSTITUTE OF RESEARCH  
 DIV OF RES SUPP, PATH SERV GP  
 PRESIDIO OF SAN FRANCISCO, CA 94129  
 SPECIES: MOUSE/ICR

PRINTED: 13-SEP-88  
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SUMMARY STATISTICS FOR % ORGAN TO BODY WEIGHT RATIO

STUDY NUMBER: GLP86007

REPORT FOR FINAL SACRIFIC (ALL SUBGROUPS)

STUDY START DATE: 01-APR-87

STUDY TYPE:

ANIMAL VO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	BRAIN	LIVER	KIDNEY	HEART	SPLEEN	ADRENAL	OVARIES	TESTES
21/M	1/1	33.00	1.470	5.682	1.415	0.558	0.285			0.788
26/M	1/1	40.00	1.240	5.095	1.533	0.548	0.265			0.698
32/M	1/1	46.00	1.100	6.300	1.554	0.550	0.289			0.650
38/M	1/1	42.00	1.243	5.498	1.826	0.512	0.286			0.664
45/M	1/1	39.00	1.377	5.818	1.431	0.436	0.203			0.626
66/M	1/1	35.00	1.277	4.034	1.663	0.749	0.251			0.820
75/M	1/1	47.00	1.081	4.981	1.583	0.464	0.243			0.677
82/M	1/1	40.00	1.280	4.325	1.705	0.768	0.237			0.685
83/M	1/1	44.00	1.214	5.107	1.480	0.450	0.286			0.677
93/M	1/1	47.00	1.121	5.013	1.538	0.485	0.257			0.611
M E A N:			1.240	5.185	1.573	0.552	0.260			0.689
STANDARD DEVIATION:			0.122	0.678	0.128	0.117	0.028			0.066
30/M	2/1	35.00	1.431	5.786	1.406	0.654	0.223			0.709
31/M	2/1	37.00	1.457	5.141	1.486	0.449	0.373			0.846
34/M	2/1	39.00	1.336	5.526	1.715	0.528	0.272			0.803
36/M	2/1	36.00	1.300	5.161	1.586	0.494	0.283			0.856
40/M	2/1	38.00	1.432	5.292	1.697	0.471	0.245			0.921
56/M	2/1	36.00	1.461	5.017	1.669	0.675	0.267			0.736
63/M	2/1	41.00	6.656	5.173	1.622	0.480	0.317			0.639
65/M	2/1	45.00	1.209	5.311	1.573	0.591	0.340			0.724
81/M	2/1	38.00	1.308	5.000	1.374	0.550	0.295			0.958
85/M	2/1	43.00	1.237	5.000	1.842	0.558	0.330			0.856
M E A N:			1.883	5.241	1.597	0.545	0.294			0.805
STANDARD DEVIATION:			1.680	0.252	0.145	0.077	0.046			0.101
24/M	3/1	34.00	1.718	5.662	1.797	0.118	0.232			0.718
42/M	3/1	36.00	1.472	5.364	1.444	0.453	0.283			0.703
44/M	3/1	43.00	1.070	5.384	1.630	0.498	0.237			0.549
51/M	3/1	44.00	1.180	5.545	1.664	0.548	0.225			0.643
52/M	3/1	42.00	1.202	5.526	1.517	0.493	0.383			0.579
55/M	3/1	38.00	1.263	5.516	1.613	0.561	0.226			0.624
78/M	3/1	42.00	1.107	5.324	1.607	0.493	0.267			0.719
84/M	3/1	38.00	1.495	4.932	1.763	0.489	0.347			0.897
94/M	3/1	38.00	1.442	4.521	1.679	0.637	0.311			0.784
96/M	3/1	39.00	1.364	4.618	1.285	0.438	0.228			0.733
M E A N:			1.331	5.239	1.600	0.473	0.274			0.695
STANDARD DEVIATION:			0.203	0.404	0.152	0.137	0.056			0.102

## Appendix N (cont.): ORGAN-TO-BODY WEIGHT RATIO

LETTERMAN ARMY INSTITUTE OF RESEARCH			SUMMARY STATISTICS FOR % ORGAN TO BODY WEIGHT RATIO					PRINTED: 13-SEP-88		
DIV OF RES SUPP, PATH SERV GP			STUDY NUMBER: GLP86007					PAGE: 2		
PRESIDIO OF SAN FRANCISCO, CA 94129			REPORT FOR FINAL SACRIFIC (ALL SUBGROUPS)							
SPECIES: MOUSE/ICR			STUDY START DATE: 01-APR-87					STUDY TYPE:		
ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	BRAIN	LIVER	KIDNEY	HEART	SPLEEN	ADRENAL	OVARIES	TESTES
27/M	4/1	36.00	1.411	5.636	0.311	0.489	0.247			0.733
47/M	4/1	39.00	1.477	5.172	1.726	0.474	0.413			0.964
48/M	4/1	40.00	1.290	5.652	1.620	0.488	0.607			5.390
57/M	4/1	40.00	1.457	5.412	1.648	0.373	0.235			0.772
58/M	4/1	42.00	1.329	5.095	1.631	0.529	0.298			0.829
61/M	4/1	42.00	1.190	4.798	1.390	0.421	0.186			0.719
62/M	4/1	39.00	1.487	5.669	1.469	0.551	0.203			0.728
73/M	4/1	37.00	1.400	5.378	1.532	0.495	0.368			0.765
92/M	4/1	40.00	1.320	5.255	1.610	0.430	0.308			0.658
95/M	4/1	41.00	1.193	4.029	1.341	0.473	0.234			0.729
M E A N:			1.355	5.210	1.428	0.472	0.310			1.229
STANDARD DEVIATION:			0.109	0.499	0.411	0.052	0.127			1.464

## Appendix N (cont.): ORGAN-TO-BODY WEIGHT RATIO

LETTERMAN ARMY INSTITUTE OF RESEARCH  
 DIV OF RES SUPP, PATH SERV GP  
 PRESIDIO OF SAN FRANCISCO, CA 94129  
 SPECIES: MOUSE/ICR

SUMMARY STATISTICS FOR % ORGAN TO BODY WEIGHT RATIO  
 STUDY NUMBER: GLP86007  
 REPORT FOR FINAL SACRIFIC (ALL SUBGROUPS)  
 STUDY START DATE: 01-APR-87

PRINTED: 13-SEP-88  
 PAGE: 1  
 STUDY TYPE:

ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	BRAIN	LIVER	KIDNEY	HEART	SPLEEN	ADRENAL	OVARIES	TESTES
114/F	1/2	31.00	1.526	5.471	1.432	0.448	0.448		0.155	
116/F	1/2	27.00	2.078	5.474	1.726	0.515	0.370		0.219	
117/F	1/2	28.00	1.804	5.379	1.332	0.550	0.375		0.207	
129/F	1/2	33.00	1.709	4.994	1.233	0.585	0.379		0.245	
135/F	1/2	29.00	1.866	4.938	1.486	0.621	0.438		0.014	
140/F	1/2	27.00	1.896	5.707	1.496	0.578	0.489		0.111	
145/F	1/2	36.00	1.189	4.622	1.419	0.431	0.294		0.139	
165/F	1/2	31.00	1.461	4.687	1.106	0.445	0.239		0.119	
168/F	1/2	30.00	1.647	5.540	1.373	0.440	0.457		0.067	
178/F	1/2	30.00	1.670	4.477	1.217	0.457	0.437		0.053	
MEAN:			1.684	5.129	1.382	0.507	0.393		0.133	
STANDARD DEVIATION:			0.252	0.439	0.175	0.072	0.078		0.076	
101/F	2/2	28.00	1.821	5.539	1.561	0.721	0.450		0.193	
111/F	2/2	32.00	1.647	4.822	0.903	0.406	0.259		0.128	
121/F	2/2	28.00	2.371	5.854	1.682	0.614	0.357		0.143	
124/F	2/2	29.00	1.793	4.928	1.452	0.521	0.403		0.155	
133/F	2/2	26.00	2.058	7.281	1.681	0.338	0.450		0.173	
134/F	2/2	28.00	1.818	5.989	1.439	0.586	0.329		0.211	
143/F	2/2	27.00	2.011	5.115	1.241	0.704	0.319		0.156	
144/F	2/2	31.00	1.526	5.252	1.281	0.503	0.155		0.087	
155/F	2/2	32.00	1.737	5.381	1.256	0.431	0.441		0.081	
158/F	2/2	33.00	1.667	5.158	1.167	0.430	0.306		0.061	
MEAN:			1.845	5.532	1.366	0.526	0.347		0.139	
STANDARD DEVIATION:			0.245	0.719	0.245	0.129	0.095		0.049	
105/F	3/2	29.00	1.700	5.800	1.283	0.717	0.379		0.252	
118/F	3/2	31.00	1.732	5.648	1.455	0.548	0.339		0.194	
122/F	3/2	28.00	1.711	4.964	1.132	0.379	0.368		0.143	
150/F	3/2	28.00	2.107	5.093	1.593	0.625	0.536		0.282	
152/F	3/2	29.00	1.572	5.424	1.355	0.338	0.421		0.155	
160/F	3/2	30.00	1.113	4.757	1.067	0.490	0.263		0.040	
163/F	3/2	31.00	1.842	4.235	1.348	0.468	0.329		0.116	
167/F	3/2	30.00	1.973	4.477	1.357	0.547	0.287		0.090	
173/F	3/2	29.00	1.731	4.124	1.166	0.534	0.200		0.048	
181/F	3/2	30.00	1.657	5.063	1.353	0.490	0.207		0.080	
MEAN:			1.714	4.959	1.311	0.514	0.333		0.140	
STANDARD DEVIATION:			0.263	0.570	0.157	0.110	0.102		0.092	

## Appendix N (cont.): ORGAN-TO-BODY WEIGHT RATIO

LETTERMAN ARMY INSTITUTE OF RESEARCH DIV OF RES SUPP, PATH SERV GP PRESIDIO OF SAN FRANCISCO, CA 94129 SPECIES: MOUSE/ICR			SUMMARY STATISTICS FOR % ORGAN TO BODY WEIGHT RATIO					STUDY TYPE:	
			STUDY NUMBER: GLP86007					PRINTED: 13-SEP-88	
			REPORT FOR FINAL SACRIFIC (ALL SUBGROUPS)					PAGE: 2	
			STUDY START DATE: 01-APR-87						
ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	BRAIN	LIVER	KIDNEY	HEART	SPLEEN	ADRENAL	TESTES
120/F	4/2	27.00	1.881	6.919	1.493	0.596	0.352		0.148
128/F	4/2	27.00	1.978	5.237	1.511	0.593	5.274		0.222
139/F	4/2	27.00	2.048	4.659	1.496	0.667	0.496		0.070
149/F	4/2	26.00	1.981	5.662	1.292	0.558	0.542		0.092
154/F	4/2	29.00	1.917	4.883	1.341	0.600	0.493		0.121
156/F	4/2	30.00	1.733	5.703	1.220	0.663	0.403		0.153
157/F	4/2	30.00	1.643	5.410	1.273	0.577	0.363		0.160
174/F	4/2	29.00	1.738	4.769	1.090	0.403	0.238		0.083
180/F	4/2	26.00	2.038	4.488	1.346	0.412	0.315		0.050
182/F	4/2	31.00	1.945	4.406	1.287	0.516	0.397		0.113
MEAN:			1.890	5.214	1.335	0.558	0.887		0.121
STANDARD DEVIATION:			0.140	0.759	0.135	0.091	1.544		0.051

## Appendix O: ORGAN-TO-BRAIN WEIGHT RATIO

LETTERMAN ARMY INSTITUTE OF RESEARCH  
 DIV OF RES SUPP, PATH SERV GP  
 PRESIDIO OF SAN FRANCISCO, CA 94129  
 SPECIES: MOUSE/ICR

PRINTED: 13-SEP-88

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SUMMARY STATISTICS FOR % ORGAN TO BRAIN WEIGHT RATIO

STUDY NUMBER: GLP86007

REPORT FOR INTERIM SACRIFICE NUMBER (ALL SUBGROUPS)

STUDY START DATE: 01-APR-87

STUDY TYPE:

ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	BRAIN	LIVER	KIDNEY	HEART	SPLEEN	ADRENAL	OVARIES	TESTES
37/M	1/1	34.00	100.000	343.870	109.004	43.103	18.391			50.383
41/M	1/1	38.00	100.000	405.219	125.470	38.205	24.426			67.015
77/M	1/1	37.00	100.000	415.058	119.305	40.734	26.834			59.459
79/M	1/1	39.00	100.000	425.319	90.213	31.702	23.830			59.362
80/M	1/1	38.00	100.000	367.681	103.232	35.551	18.251			60.646
		M E A N:	100.000	391.429	109.445	37.859	22.346			59.373
		STANDARD DEVIATION:	0.000	34.362	13.808	4.447	3.843			5.934
20/M	2/1	33.00	100.000	379.545	92.614	29.735	20.833			53.409
71/M	2/1	38.00	100.000	395.859	125.880	36.439	19.876			51.553
88/M	2/1	35.00	100.000	364.729	113.372	35.853	22.093			50.388
90/M	2/1	41.00	100.000	278.692	121.308	47.679	19.831			62.025
98/M	2/1	32.00	100.000	319.262	87.500	30.123	22.951			59.426
		M E A N:	100.000	347.618	108.135	35.966	21.117			55.360
		STANDARD DEVIATION:	0.000	47.943	17.194	7.253	1.377			5.099
33/M	3/1	35.00	100.000	472.258	91.183	47.312	87.097			54.624
39/M	3/1	40.00	100.000	461.947	111.726	48.230	23.009			53.761
49/M	3/1	37.00	100.000	461.834	102.559	41.151	18.763			47.974
50/M	3/1	33.00	100.000	423.451	105.752	44.243	17.699			55.088
59/M	3/1	34.00	100.000	351.993	89.312	30.978	16.667			56.341
		M E A N:	100.000	434.297	100.106	42.384	32.647			53.558
		STANDARD DEVIATION:	0.000	49.637	9.605	6.956	30.534			3.257
25/M	4/1	33.00	100.000	383.698	97.217	39.364	22.863			49.304
46/M	4/1	32.00	100.000	294.343	85.401	32.664	13.321			54.015
54/M	4/1	33.00	100.000	390.119	107.510	48.221	18.775			56.324
67/M	4/1	37.00	100.000	333.627	98.592	33.451	20.070			54.049
72/M	4/1	31.00	100.000	325.267	74.021	36.655	20.819			44.840
		M E A N:	100.000	345.411	92.548	38.071	19.170			51.706
		STANDARD DEVIATION:	0.000	40.673	13.005	6.271	3.589			4.611

# Appendix O (cont.): ORGAN-TO-BRAIN WEIGHT RATIO

LETTERMAN ARMY INSTITUTE OF RESEARCH  
DIV OF RES SUPP, PATH SERV GP  
PRESIDIO OF SAN FRANCISCO, CA 94129  
SPECIES: MOUSE/ICR

SUMMARY STATISTICS FOR % ORGAN TO BRAIN WEIGHT RATIO  
STUDY NUMBER: GLP86007  
REPORT FOR INTERIM SACRIFICE NUMBER (ALL SUBGROUPS)  
STUDY START DATE: 01-APR-87

PRINTED: 13-SEP-88  
PAGE: 1

STUDY TYPE:

ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	BRAIN	LIVER	KIDNEY	HEART	SPLEEN	ADRENAL	OVARIES	TESTES
126/F	1/2	28.00	100.000	291.813	69.786	29.825	19.298		9.162	
130/F	1/2	29.00	100.000	310.634	73.881	29.851	22.388		71.828	
151/F	1/2	29.00	100.000	254.291	62.172	37.478	16.462		8.406	
133/F	1/2	29.00	100.000	343.897	85.225	26.981	24.839		3.854	
161/F	1/2	27.00	100.000	262.948	70.916	27.490	22.311		7.570	
		M E A N:	100.000	292.717	72.396	30.325	21.060		20.164	
		STANDARD DEVIATION:	0.000	36.414	8.371	4.209	3.235		28.953	
99/F	2/2	29.00	100.000	305.882	72.106	26.755	25.617		3.036	
146/F	2/2	28.00	100.000	277.519	75.581	32.364	19.767		9.884	
169/F	2/2	28.00	100.000	266.972	66.055	32.844	18.716		8.991	
171/F	2/2	28.00	100.000	264.453	71.875	28.125	16.016		4.102	
175/F	2/2	27.00	100.000	280.705	71.992	37.552	18.672		5.809	
		M E A N:	100.000	279.107	71.522	31.528	19.758		6.364	
		STANDARD DEVIATION:	0.000	16.462	3.430	4.274	3.557		2.991	
109/F	3/2	32.00	100.000	329.369	61.982	24.685	30.631		10.631	
112/F	3/2	26.00	100.000	253.953	72.332	30.040	19.763		10.672	
125/F	3/2	27.00	100.000	248.289	69.772	28.327	21.483		10.076	
132/F	3/2	26.00	100.000	306.991	123.404	16.109	29.787		13.982	
162/F	3/2	25.00	100.000	231.445	72.461	32.031	22.070		5.469	
		M E A N:	100.000	274.009	79.990	26.238	24.747		10.166	
		STANDARD DEVIATION:	0.035	41.917	24.642	6.273	5.067		3.046	
107/F	4/2	26.00	100.000	223.719	63.947	29.412	28.083		11.006	
127/F	4/2	27.00	100.000	296.674	74.220	28.482	21.414		8.108	
148/F	4/2	29.00	100.000	286.926	29.505	31.625	22.968		7.951	
164/F	4/2	27.00	100.000	236.612	63.388	25.137	16.576		8.925	
166/F	4/2	29.00	100.000	280.367	62.569	27.156	21.468		4.587	
		M E A N:	100.000	264.859	58.726	28.362	22.102		8.115	
		STANDARD DEVIATION:	0.000	32.519	17.012	2.430	4.121		2.318	





## Appendix O (cont.): ORGAN-TO-BRAIN WEIGHT RATIO

LETTERMAN ARMY INSTITUTE OF RESEARCH			SUMMARY STATISTICS FOR % ORGAN TO BRAIN WEIGHT RATIO					PRINTED: 13-SEP-88		
DIV OF RES SUPP, PATH SERV GP			STUDY NUMBER: GLP86007					PAGE: 2		
PRESIDIO OF SAN FRANCISCO, CA 94129			REPORT FOR FINAL SACRIFIC (ALL SUBGROUPS)							
SPECIES: MOUSE/ICR			STUDY START DATE: 01-APR-87					STUDY TYPE:		
ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	BRAIN	LIVER	KIDNEY	HEART	SPLEEN	ADRENAL	OVARIES	TESTES
27/M	4/1	36.00	100.000	399.409	22.047	34.646	17.520			51.969
47/M	4/1	39.00	100.000	350.174	116.840	32.118	27.951			65.278
48/M	4/1	40.00	100.000	438.178	125.581	37.791	47.093			417.829
57/M	4/1	40.00	100.000	371.355	113.036	25.557	16.123			53.002
58/M	4/1	42.00	100.000	383.513	122.760	39.785	22.401			62.366
61/M	4/1	42.00	100.000	403.000	116.800	35.400	15.600			60.400
62/M	4/1	39.00	100.000	381.207	98.793	37.069	13.621			48.966
73/M	4/1	37.00	100.000	384.170	109.459	35.328	26.255			54.633
92/M	4/1	40.00	100.000	398.106	121.970	32.576	23.295			49.811
95/M	4/1	41.00	100.000	337.832	112.474	39.673	19.632			61.145
M E A N:			100.000	384.694	105.976	34.994	22.949			92.540
STANDARD DEVIATION:			0.000	28.229	30.472	4.223	9.703			114.434

## Appendix O (cont.): ORGAN-TO-BRAIN WEIGHT RATIO

LETTERMAN ARMY INSTITUTE OF RESEARCH  
 DIV OF RES SUPP, PATH SERV GP  
 PRESIDIO OF SAN FRANCISCO, CA 94129  
 SPECIES: MOUSE/ICR

SUMMARY STATISTICS FOR % ORGAN TO BRAIN WEIGHT RATIO  
 STUDY NUMBER: GLP86007  
 REPORT FOR FINAL SACRIFIC (ALL SUBGROUPS)  
 STUDY START DATE: 01-APR-87

PRINTED: 13-SEP-88  
 PAGE: 1  
 STUDY TYPE:

ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	BRAIN	LIVER	KIDNEY	HEART	SPLEEN	ADRENAL	OVARIES	TESTES
114/F	1/2	31.00	100.000	358.562	93.869	29.387	29.387		10.148	
116/F	1/2	27.00	100.000	263.458	83.066	24.777	17.825		10.517	
117/F	1/2	28.00	100.000	298.218	73.861	30.495	20.792		11.485	
129/F	1/2	33.00	100.000	292.199	72.163	34.220	22.163		14.362	
135/F	1/2	29.00	100.000	264.695	79.667	33.272	23.475		0.739	
140/F	1/2	27.00	100.000	300.977	78.906	30.469	25.781		5.859	
145/F	1/2	36.00	100.000	388.785	119.393	36.215	24.766		11.682	
165/F	1/2	31.00	100.000	320.751	75.717	30.464	16.336		8.168	
168/F	1/2	30.00	100.000	336.437	83.401	26.721	27.733		4.049	
178/F	1/2	30.00	100.000	268.064	72.854	27.345	26.148		3.194	
MEAN:			100.000	309.215	83.290	30.336	23.441		8.020	
STANDARD DEVIATION:			0.000	42.016	14.246	3.530	4.203		4.386	
101/F	2/2	28.00	100.000	304.118	85.686	39.608	24.706		10.588	
111/F	2/2	32.00	100.000	292.789	54.839	24.668	15.750		7.780	
121/F	2/2	28.00	100.000	246.837	70.934	25.904	15.060		6.024	
124/F	2/2	29.00	100.000	274.808	80.962	29.038	22.500		8.654	
133/F	2/2	26.00	100.000	353.832	81.382	16.449	21.869		8.411	
134/F	2/2	28.00	100.000	329.470	79.175	32.220	18.075		11.591	
143/F	2/2	27.00	100.000	254.328	61.694	34.991	15.838		7.735	
144/F	2/2	31.00	100.000	344.186	83.932	32.981	10.148		5.708	
155/F	2/2	32.00	100.000	309.712	72.302	24.820	25.360		4.676	
158/F	2/2	33.00	100.000	309.455	70.000	25.818	18.364		3.636	
MEAN:			100.000	301.953	74.121	28.650	18.767		7.480	
STANDARD DEVIATION:			0.000	35.715	10.090	6.557	4.815		2.513	
105/F	3/2	29.00	100.000	341.176	75.456	42.191	22.312		14.807	
118/F	3/2	31.00	100.000	326.071	83.985	31.657	19.553		11.173	
122/F	3/2	28.00	100.000	290.188	66.180	22.129	21.503		8.351	
150/F	3/2	28.00	100.000	241.695	75.593	29.661	25.424		13.390	
152/F	3/2	29.00	100.000	344.956	86.184	21.491	26.754		9.868	
160/F	3/2	30.00	100.000	427.246	95.808	44.012	23.653		3.593	
163/F	3/2	31.00	100.000	229.947	73.205	25.394	17.863		6.305	
167/F	3/2	30.00	100.000	226.858	68.750	27.703	14.527		4.561	
173/F	3/2	29.00	100.000	238.247	67.331	30.876	11.554		2.789	
181/F	3/2	30.00	100.000	305.634	81.690	29.577	12.475		4.829	
MEAN:			100.000	297.202	77.418	30.469	19.562		7.967	
STANDARD DEVIATION:			0.000	65.070	9.455	7.508	5.341		4.222	

# Appendix O (cont.): ORGAN-TO-BRAIN WEIGHT RATIO

LETTERMAN ARMY INSTITUTE OF RESEARCH  
 DIV OF RES SUPP, PATH SERV GP  
 PRESIDIO OF SAN FRANCISCO, CA 94129  
 SPECIES: MOUSE/ICR

PRINTED: 13-SEP-88  
 PAGE: 2

SUMMARY STATISTICS FOR % ORGAN TO BRAIN WEIGHT RATIO

STUDY NUMBER: GLP86007  
 REPORT FOR FINAL SACRIFIC (ALL SUBGROUPS)  
 STUDY START DATE: 01-APR-87

STUDY TYPE:

ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	BRAIN	LIVER	KIDNEY	HEART	SPLEEN	ADRENAL	OVARIES	TESTES
120/F	4/2	27.00	100.000	367.717	79.331	31.693	18.701		7.874	
128/F	4/2	27.00	100.000	264.794	76.404	29.963	266.667		11.236	
139/F	4/2	27.00	100.000	227.486	73.056	32.550	24.231		3.436	
149/F	4/2	26.00	100.000	285.825	65.243	28.155	27.379		4.660	
154/F	4/2	29.00	100.000	254.676	69.964	31.295	25.719		6.295	
156/F	4/2	30.00	100.000	329.038	70.385	38.269	23.269		8.846	
157/F	4/2	30.00	100.000	329.209	77.485	35.091	22.110		9.736	
174/F	4/2	29.00	100.000	274.405	62.698	23.214	13.690		4.762	
180/F	4/2	26.00	100.000	220.189	66.038	20.189	15.472		2.453	
182/F	4/2	31.00	100.000	226.534	66.169	26.534	20.398		5.804	
		M E A N:		277.987	70.677	29.695	45.764		6.510	
		STANDARD DEVIATION:		50.124	5.728	5.397	77.738		2.848	

## Appendix P: PATHOLOGY REPORT

GLP Study 86007

Principal Investigator : Cpt Frost    APC # TLBO

### I. Introduction:

Study: 90-Day Subchronic Oral Toxicity Study in Mice/Nitroguanidine

Test Substance: Nitroguanidine (CAS No. 556-88-7; LAIR CODE TP036)

Species: Mus musculus    Strain: ICR    Sex: 70 males and 70 females

Body Weight Range: 18-25 grams    Age: approximately 5 weeks

Dosage group:	Number of animals/group		
Group 1 - Control	0	mg/kg	30
Group 2 - Low Dose	100	mg/kg	30
Group 3 - Middle Dose	316	mg/kg	30
Group 4 - High Dose	1000	mg/kg	30
Group 5 - Baseline	sacrificed day 1 of study		20

### II. Summary of Procedures:

Euthanasia:	Sodium Pentobarbital, IP
Tissue Fixative:	10% buffered formalin
Histopathology:	Routine
Clinical Lab:	Hematology/serology
Other procedures:	Organ weights

III. Gross Findings: The incidence summary reports for gross necropsy observations for the final sacrifice and interim sacrifices 1 and 2 are listed in tables 1, 2, and 3 respectively.

IV. Microscopic Findings: Tissues taken for formalin preservation from all groups were: brain, trachea, thyroid glands, parathyroid, esophagus, parotid gland, mandibular gland, sub-lingual gland, exorbital lacrimal gland, heart, aorta, lungs, thymus, spleen, mesenteric lymph nodes, gall bladder, kidney, urinary bladder, uterus, accessory sex organ, testes, ovaries, duodenum, jejunum, ileum, pancreas, cecum, rectum, colon, stomach, skeletal muscle, sciatic nerve, tongue, skin, mammary gland, bone (sternum), adrenal glands, pituitary gland, eyes and optic nerve, liver, Harderian gland.

All tissues were examined in control, high dose and baseline (groups 1, 4 and 5). Target tissues (brain, liver, kidney, lung and urinary bladder) were examined in all groups, and were the only tissues examined routinely in Groups 2 and 3.

Tables 4, 5, and 6 list the incidence summary (with %) of microscopic observations of tissues with recorded findings from the final, interim sacrifice 1 and interim sacrifice 2 respectively. Statistically compared microscopic lesions between final and intermediate sacrifice

**Appendix P (cont.): PATHOLOGY REPORT**

groups at the .95 level of significance using the Kolmogorov-Smirnov two tailed test are listed in table 7.

V. Summary Comments: Compound related/induced gross or microscopic lesions were not present. All gross and microscopic lesions were minimal to mild in severity and considered to be incidental findings, commonly observed in mice. The only significant difference between controls and treated animals occurred in Group 3, females, where the amount of extramedullary hematopoiesis in the liver was lower (Table 7). This is an incidental finding and is not a dose response phenomena.



C. DAHLEM SMITH  
MAJ, VC  
Diplomate, ACVP  
Division of Pathology

18 July, 1988

**Appendix P (cont.): PATHOLOGY REPORT**

Glossary of Microscopic Findings GLP 86007

Accessory Sex Organ:

Adenitis: There are mixed inflammatory cell infiltrates of mononuclear cells within the parenchyma.

Dilated ducts: Occasionally, there are ducts lined by and partially distended with keratinous debris.

Adrenal gland:

Cortical cell vacuolation: Cortical cells near the corticomedullary junction undergo prominent vacuolization with subsequent disposition of intracellular ceroid or lipogenic pigment. This change eventually encircles the medulla.

Cortical necrosis: The transient zone X surrounds the medulla in young mice and disappears rapidly in young male mice at sexual maturity (approximately 5 weeks of age). In females this zone disappears at pregnancy or alternately may be visible for 6 months. Subsequently, lipid accumulates in this area. (see cortical cell vacuolation). Microscopically there is loss, necrosis and vacuolation of cortical cells with adjacent prominent sinusoids and occasional cellular debris.

Medullary cell vacuolation: The presence of cytoplasmic vacuolation occurs within medullary cells.

Subcapsular cell hyperplasia: In numerous strains of mice there is a proliferation of spindle cells beneath the capsule of the adrenal gland. This change involves the zona glomerulosa and extends downward into the cortex. Cells are fusiform with elliptical nuclei, scant basophilic cytoplasm and are benign in appearance.

Brain:

Fat in the choroid plexus: Several fat cells are present within the choroid plexus with no attendant disruption or compromise of adjacent nervous tissue.

**Appendix P (cont.): PATHOLOGY REPORT**

Hippocampal vacuolation: Numerous 5 to 10 micron diameter empty vacuoles are present within the hippocampal section of the brain.

Hydrocephalus: Hydrocephalus is a bilateral or unilateral enlargement or dilation of the ventricles of the brain at the expense of adjacent parenchyma which undergoes pressure atrophy or liquifaction necrosis.

**Esophagus:**

Mononuclear cellular infiltration: There are small multifocal populations of lymphocytes with lesser numbers of macrophages and plasma cells present in the submucosal tissues.

**Eyes and optic nerves:**

Bilateral retinal degeneration and/or atrophy: This is inherited in some strains of mice and can also occur as a light associated lesion, especially in nonpigmented animals. This lesion is characterized by absence of the entire outer nuclear layer of both retinas due to the degeneration of the photoreceptor outer segments or associated (non)pigmented epithelium.

**Exorbital lacrimal gland:**

Subacute adenitis: Subacute to chronic inflammation of the gland is characterized by the presence of focal or diffuse infiltrations of lymphocytes, macrophages and plasma cells, possibly accompanied by minimal to moderate loss of glandular tissue through either necrosis or atrophy. Fibrosis may or may not be present. In most cases there is intraductal accumulation of inspissated secretory material.

**Harderian gland:**

Porphyrin pigment: Within the glandular parenchyma there is porphyrin pigment which is a normal excretory product of this orbital gland and consists of acellular masses of dark brownish material.

**Kidney:**

Cortical cysts: There are single to multiple variably sized dilated cystic structures within the renal cortex which are distended with light to dark

**Appendix P (cont.): PATHOLOGY REPORT**

acellular eosinophilic material and a few degenerating cells. These cysts are lined by flattened epithelium and displace and compress adjacent tissue.

Hydronephrosis: There is a uniform diffuse expansion of the urinary space with a concomitant loss of medullary and cortical parenchyma. This change may range from minimal with negligible tissue loss to severe with extensive loss of the medulla and cortex. This lesion may be bilateral or unilateral.

Lymphocytes, interstitial: There are multifocal interstitial aggregates of lymphocytes and histiocytes randomly distributed through the renal cortex. Loss or disruption of normal tissue is minimal.

Mineralization: There are multifocal small interstitial and/or intratubular accumulations of basophilic acellular material with concomitant disruption of adjacent cells.

Progressive renal disease: Glomerulonephritis is one of the most common renal diseases of mice and is often associated with either persistent viral diseases or with immune disorders. Glomeruli have proteinaceous deposits followed later by tubular atrophy and proteinaceous tubular casts.

In addition, a chronic nephropathy also occurs in mice as an incidental aging lesion and resembles that seen in rats. There are multiple foci of interstitial lymphocytes and histiocytes, interstitial fibrosis, tubular casts of proteinaceous material and thickened basement membranes of the glomeruli and tubules.

Pyelonephritis: Within the medulla, there are mixed infiltrates of neutrophilic and mononuclear inflammatory cells, fibrosis, necrosis, tubules dilated with proteinaceous casts, and loss of tubular structures. These changes may extend in a radial fashion into the cortex. There may be cellular debris present in the urinary space.

**Liver:**

Extramedullary hematopoiesis: Hematopoiesis is normally



**Appendix P (cont.): PATHOLOGY REPORT**

present in the spleen throughout the life of the mouse, and is present in the young and juvenile mouse liver. There are multifocal populations of large, basophilic nucleated cells or blood islands randomly distributed within sinusoids between hepatocellular cords.

Granuloma: There is an occasional small focus of macrophages with a few lymphocytes present within the hepatic parenchyma. Hepatocytes may be displaced and degenerated.

Idiopathic foci of basophilic, eosinophilic, vacuolated and/or pleomorphic hepatocytes: There are foci and areas of hepatocellular alteration which are uniform in size, have a diameter less than a hepatic lobule, and have architectural alteration. There is minimal to no compression of surrounding parenchyma although the appearance and staining reactions of the cells sharply demarcate the altered area from normal hepatocytes. Usually each focus is either basophilic, eosinophilic or vacuolated. Occasionally, within a focus there is a mixture of a few cells from one of the other two types.

Microabscess: There is an occasional random small focus of hepatocellular necrosis, debris and an inflammatory infiltrate of neutrophils and mononuclear cells. This may progress to a granuloma.

Periportal mononuclear cellular infiltration: Within randomly distributed portal areas are populations of lymphocytes with lesser numbers of macrophages and occasional plasma cells. There is no attendant tissue disruption.

Lungs

Adenomatous hyperplasia of the alveolar epithelium (adenomatosis):

Adenomatosis of the lung is a focal hyperplastic non-neoplastic proliferation of Type 2 alveolar epithelial cells with or without inflammatory cell infiltration. This lesion frequently occurs in centriacinar regions of the lung at the junction of conducting airways and exchange tissue. Type 2 cell proliferation is frequently accompanied by infiltration

**Appendix P (cont.): PATHOLOGY REPORT**

of alveolar macrophages both within affected alveolar lumens and within the interstitium.

B alveolar cell adenoma: Bronchiolar/alveolar cell adenoma is a well-demarcated, usually focal, area of cuboidal cells forming solid, glandular or papillary patterns with concomitant compression and obliteration of adjacent pulmonary tissue. Cells are uniform with variable nuclear features and moderate amounts of amphophilic cytoplasm.

Perivascular lymphoid aggregations (cuffing): There are multifocal minimal to moderate lymphoid nodules present adjacent and around both medium to large airways and vascular structures.

Vascular congestion: There are multifocal areas of alveolar capillary distension by red blood cells.

Mammary gland:

Physiologically active: Glandular lumina distended with eosinophilic proteinic material and lined by large, basophilic but benign epithelium are present in subcutaneous tissue.

Mesenteric Lymph Node:

Composite lymphoma: Synonym: reticulum-cell sarcoma, type B. This is a neoplastic lesion of lymphatic organs. The cell of origin is ill-defined. Early involvement occurs in the mesenteric lymph nodes, then extends to other nodes and the liver, spleen, kidney, thymus and lungs. Preneoplastic changes consist of follicular hyperplasia with prominent germinal centers, sinus histiocytosis, presence of pyroninophilic cells, medullary plasmacytosis and epithelioid sarcomatous-like nodules.

Erythrophagocytosis: Within the sinusoids are numerous macrophages laden with intracellular erythrocytes.

Sinus histiocytosis: There is an increase in the numbers of histiocytes (macrophages), both fixed and circulating, within the medullary sinuses of the node between the medullary cords. This hyperplasia of the mononuclear phagocytic system may be extensive enough to fill the sinuses.

## Appendix P (cont.): PATHOLOGY REPORT

### Ovaries:

Cysts, paraovarian: The paraovarian cyst is a loosely used term to refer to a variety of cystic structures located adjacent to the ovary. The cysts may have one or all of the following: a thin wall of connective tissue and muscle fibers, lining of low columnar epithelium with clear cytoplasm, presence of a basement membrane.

Cysts, follicular: The follicular cyst develops from a follicle which has arrested development at some stage of the ovulatory cycle. Depending on the stage, follicular distension may be due to cellular debris or proteinic fluid. This appears as a round cyst within the ovary lined by compressed luteal tissue.

### Pancreas:

Subacute pancreatitis: There are mixed inflammatory infiltrates composed of mononuclear cells with lesser numbers of neutrophils. Glandular tissue destruction, necrosis and loss are followed by fibrosis.

### Parathyroids:

C cell hyperplasia: There are increased numbers of chief cells subdivided into small groups by fine connective tissue strands and capillaries. These cells are cuboidal with eosinophilic cytoplasm. There is no compression of surrounding tissue.

### Rectum:

Dilated sebaceous ducts: There are a few submucosal sebaceous glands with ducts lined by and partially distended by keratinous debris. This change may or may not be concomitant with suppurative adenitis of the sebaceous gland.

Suppurative adenitis of sebaceous gland: An inflammatory infiltrate of neutrophils with lesser numbers of lymphocytes and macrophages, admixed with cellular necrotic debris, is present and obliterates random small areas of glandular tissue.

**Appendix P (cont.): PATHOLOGY REPORT**

**Salivary Gland (Parotid, Mandibular or Sub-Lingual):**

**Adenitis:** There are multifocal mixed inflammatory foci characterized by interstitial infiltrates of lymphocytes with lesser numbers of macrophages and occasional plasma cells. There is minimal loss or disruption of normal parenchyma.

**Ductal fibrosis:** There are occasional, multifocal, minimal to mild, increased fibrous connective tissue foci with trapped ductular structures and lymphocytes.

**Skeletal muscle:**

**Regeneration:** Multifocal areas of degeneration of myocytes, with hypertrophy of satellite cells, a mild mononuclear cell infiltrate, and small amounts of cellular debris and mineralization are present in skeletal muscle. Concomitant regenerative basophilic nuclei are lined up in rows in the middle of adjacent myocytes.

**Spleen:**

**Extramedullary hematopoiesis:** Hematopoiesis is normally present in the spleen throughout the life of the mouse, and is also present in the young and juvenile mouse liver. There are multifocal populations of large, basophilic nucleated cells or blood islands randomly distributed within sinusoids.

**Myeloid hyperplasia:** There is an increase of the myeloid component of the normal hematopoiesis that occurs within the red pulp of the spleen.

**Stomach:**

**Glandular cysts:** Within the glandular mucosa, occasional crypts are dilated, distended with cellular debris and are lined by flattened crypt cells.

**Thymus:**

**Cysts:** Cysts are occasional, variably sized, round follicles which are distended with amphophilic acellular material and cellular debris.

**Appendix P (cont.): PATHOLOGY REPORT**

**Thyroid**

Colloid cyst: Colloid cyst is the presence of greatly enlarged (over twice the size of an average follicle) colloid-filled cystic space within the thyroid gland. Epithelial cells lining such cysts are usually flattened. One or more colloid cysts may occur within a single thyroid gland.

**Urinary bladder:**

Mononuclear cellular infiltration: There are random multifocal accumulations of lymphocytes with lesser numbers of histiocytes and plasma cells in the submucosal tissues. These accumulations are often just below the urothelium.

TABLE 1 Page 1 of 1

LETTERMAN ARMY INSTITUTE OF RESEARCH			INCIDENCE SUMMARY REPORT FOR GROSS NECROPSY OBSERVATIONS			PRINTED: 12-JUL-88		
DIV OF RES SUPP, PATH SERV GP			STUDY NUMBER: GLP86007			PAGE: 1		
PRESIDIO OF SAN FRANCISCO, CA 94129			REPORT FOR FINAL SACRIFICE			STUDY TYPE:		
SPECIES: MOUSE/ICR			STUDY START DATE: 01-APR-87					
NOTE: CTLS = CONTROLS			ANIMAL SEX:					
FROM GROUP(S): 1			GROUP:					
			NO. IN GROUP:					
			CTLS			CTLS		
			10 10 10 4 5			10 10 10 10 0		
			-- MALES --			-- FEMALES --		
			2 3 4 5			2 3 4 5		
			10 10 10 10 0			10 10 10 10 0		
ACCESSORY SEX OR								
ENLARGED.2.PREPUTIAL GLAND			0 1 1 1 0			0 1 1 1 0		
ABNORMAL COLOR			0 1 0 0 0			0 1 0 0 0		
ABNORMAL COLOR CENTRAL PALOR			0 0 1 1 0			0 0 1 1 0		
TOTAL:			0 2 2 2 0			0 0 0 0 0		
ADRENAL								
ECTOPIC			0 0 0 0 0			0 1 0 0 0		
TOTAL:			0 0 0 0 0			0 1 0 0 0		
HARDERIAN GLAND								
MULTIFOCAL BLACK SPECKLING			1 0 1 1 0			1 1 1 1 0		
TOTAL:			1 0 1 1 0			1 1 1 1 0		
SPLEEN								
MODULAR SURFACE			0 0 0 0 0			0 0 1 0 0		
TOTAL:			0 0 0 0 0			0 0 1 0 0		
TESTES								
ATROPHIC / SMALL, UNILATERALLY			0 1 0 0 0			0 0 0 0 0		
TOTAL:			0 1 0 0 0			0 0 0 0 0		

LETTERMAN ARMY INSTITUTE OF RESEARCH										INCIDENCE SUMMARY REPORT FOR GROSS NECROPSY OBSERVATIONS										PRINTED: 12-JUL-88																																																																																																			
DIV OF RES SUPP, PATH SERV GP										STUDY NUMBER: GLP86007										PAGE: 1																																																																																																			
PRESIDIO OF SAN FRANCISCO, CA 94129										REPORT FOR INTERIM SACRIFICE NUMBER 1																																																																																																													
SPECIES: MOUSE/ICR										STUDY START DATE: 01-APR-87										STUDY TYPE:																																																																																																			
NOTE: CTLS = CONTROLS										-- MALES --										-- FEMALES --																																																																																																			
FROM GROUP(S): 1					ANIMAL SEX:					CTLS					2					3					4					5																																																																																									
GROUP:					NO. IN GROUP:					0					0					0					0					10																																																																																									
WHOLE BODY																																																																																																																							
NO GROSS LESIONS RECOGNIZED.																				0																				0																				0																				10																																							
TOTAL:																				0																				0																				0																				0																				10																			

LETTERMAN ARMY INSTITUTE OF RESEARCH			INCIDENCE SUMMARY REPORT FOR GROSS NECROPSY OBSERVATIONS			PRINTED: 21-NOV-88		
DIV OF RES SUPP, PATH SERV GP			STUDY NUMBER: GLP86007			PAGE: 1		
PRESIDIO OF SAN FRANCISCO, CA 94129			REPORT FOR INTERIM SACRIFICE NUMBER 2			STUDY TYPE:		
SPECIES: MOUSE/ICR			STUDY START DATE: 01-APR-87					
NOTE: CTLS = CONTROLS			ANIMAL SEX:			CTLS		
FROM GROUP(S): 1			GROUP:			2 3 4 5		
NO. IN GROUP:			MALES			FEMALES		
			CTLS	2	3	4	5	0
			5	5	5	5	5	0
WHOLE BODY								
NO GROSS LESIONS RECOGNIZED.			5	5	4	5	0	0
TOTAL:			5	5	4	5	0	0
ACCESSORY SEX OR								
ENLARGED SEMINAL VESICLE			0	0	1	0	0	0
TOTAL:			0	0	1	0	0	0
KIDNEY								
PYELONEPHRITIS			0	0	1	0	0	0
TOTAL:			0	0	1	0	0	0
OVARIES								
PARA-OVARIAN CYST(S)			0	0	0	0	0	0
TOTAL:			0	0	0	0	0	0
SPLEEN								
ENLARGED (SPLENOMEGALY)			0	0	1	0	0	0
TOTAL:			0	0	1	0	0	0

Appendix F

Table 3



LETTERMAN ARMY INSTITUTE OF RESEARCH INCIDENCE SUMMARY (WITH %) OF MICROSCOPIC OBSERVATIONS(ALL FINDING)  
DIV OF RES SUPP, PATH SERV GP STUDY NUMBER: GLP86007 PRINTED: 22-NOV-88  
PRESIDIO OF SAN FRANCISCO, CA 94129 PATHOLOGIST(S): SMITH, CATHERINE D. PAGE: 1  
SPECIES: MOUSE/ICR STUDY START DATE: 01-APR-87 STUDY TYPE:

**STUDY TYPE:**

[illegible][illegible][illegible]

PARATHYROID -C CELL HYPERPLASIA	NUMBER EXAMINED:						
4	0	0	4	0	4	0	0
0	0	0	1	0	0	0	0
0%	0%	0%	25%	0%	0%	0%	0%

[illegible]

PAROTID GLAND -DUCTAL FIBROSIS	NUMBER EXAMINED:	7	0	0	6	0	9	0	0	8	0
		0	0	0	0	0	0	0	0	0	0
		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

-ADENITIS, SUBACUTE	NUMBER EXAMINED:	0	0	0	0	0	1	0	0	0	0
		0	0	0	0	0	11	0%	0%	0%	0%
		0%	0%	0%	0%	0%	11%	0%	0%	0%	0%

[illegible]

### Table 4

LETTERMAN ARMY INSTITUTE OF RESEARCH INCIDENCE SUMMARY (WITH %) OF MICROSCOPIC OBSERVATIONS(ALL FINDING) PRINTED: 22-NOV-88  
 DIV OF RES SUPP, PATH SERV GP STUDY NUMBER: GLP86007 PAGE: 2  
 PRESIDIO OF SAN FRANCISCO, CA 94129 PATHOLOGIST(S): SMITH, CATHERINE D.  
 SPECIES: MOUSE/ICR STUDY START DATE: 01-APR-87 STUDY TYPE:

	ANIMALS AFFECTED									
	MALES					FEMALES				
NOTES: ANIMALS = FINAL SACRIFICE	CTLS	2	3	4	5	CTLS	2	3	4	5
SUBGROUPS = 1 2	10	10	10	10	0	10	10	10	10	0
TISSUES WITH FINDINGS	NO. IN GROUP									
SUB-LINGUAL GLND	NUMBER EXAMINED:	10	1	0	10	0	1	10	0	0
EXORBITAL LACRIM	NUMBER EXAMINED:	9	0	0	7	0	1	9	0	0
ADENITIS, SUBACUTE		4	0	0	2	0	0	0	0	0
		44%	0%	0%	28%	0%	0%	0%	0%	0%
HEART	NUMBER EXAMINED:	10	1	0	10	0	1	10	0	0
AORTA	NUMBER EXAMINED:	7	0	0	8	0	1	8	0	0
LUNGS	NUMBER EXAMINED:	10	10	10	10	0	1	10	10	10
PERIVASCULAR LYMPHOID AGGREGATIONS (CUFFING)		0	2	2	3	0	1	3	1	1
		0%	20%	20%	30%	0%	10%	30%	10%	10%
-VASCULAR CONGESTION		0	4	1	0	0	0	0	2	0
		0%	40%	10%	0%	0%	0%	0%	20%	0%
-ADENOMATOUS HYPERPLASIA OF THE ALVEOLAR EPITHELIAL CELLS (ADENOMATOSIS)		0	0	0	0	0	0	0	0	0
		0%	0%	0%	0%	0%	0%	0%	0%	0%
-B- ALVEOLAR CELL ADENOMA		0	0	1	0	0	0	0	0	0
		0%	0%	10%	0%	0%	0%	0%	0%	0%
THYMUS	NUMBER EXAMINED:	10	0	0	8	0	9	0	0	0
-CYST(S)		0	0	0	0	0	1	0	0	0
		0%	0%	0%	0%	0%	11%	0%	0%	0%
SPLEEN	NUMBER EXAMINED:	10	1	0	10	0	10	0	1	10
-EXTRAMEDULLARY HEMATOPOIESIS		9	0	0	10	0	10	0	0	0
		90%	0%	0%	100%	0%	100%	0%	0%	90%
-MYELOID HYPERPLASIA		0	0	0	0	0	0	0	1	0
		0%	0%	0%	0%	0%	0%	0%	100%	0%
MESENTERIC LYMN	NUMBER EXAMINED:	10	0	0	8	0	9	0	0	7
-SINUS HISTIOCYTOSIS		8	0	0	5	0	8	0	0	5
		80%	0%	0%	62%	0%	88%	0%	0%	71%

Table 4 (continued)

LETTERMAN ARMY INSTITUTE OF RESEARCH INCIDENCE SUMMARY (WITH %) OF MICROSCOPIC OBSERVATIONS(ALL FINDING) PRINTED: 22-NOV-88  
 DIV OF RES SUPP, PATH SERV GP STUDY NUMBER: GLP86007 PAGE: 3  
 PRESIDIO OF SAN FRANCISCO, CA 94129 PATHOLOGIST(S): SMITH, CATHERINE D.  
 SPECIES: MOUSE/ICR STUDY START DATE: 01-APR-87 STUDY TYPE:

NOTES: ANIMALS = FINAL SACRIFICE		-- ANIMALS		A F F E C T E D --	
CTLS = CONTROLS FROM GROUP(S): 1		-- MALES --		-- FEMALES --	
SUBGROUPS = 1 2		CTLS		CTLS	
T I S S U E S W I T H F I N D I N G S		10	10	10	10
NO. IN GROUP:		10	10	10	10
NUMBER EXAMINED:		10	0	9	0
MESENTERIC LYM N		1	0	0	0
-COMPOSITE LYMPHOMA		10%	0%	0%	0%
-ERYTHROPHAGOCYTOSIS		0	0	1	0
		0%	0%	11%	0%
GALL BLADDER	NUMBER EXAMINED:	7	8	8	9
KIDNEY	NUMBER EXAMINED:	10	10	10	10
-LYMPHOCYTES, INTERSTITIAL		4	3	4	2
		40%	30%	40%	20%
-CORTICAL CYSTS		3	0	0	0
		30%	0%	0%	0%
-HYDRONEPHROSIS		0	0	1	0
		0%	0%	10%	0%
-PROGRESSIVE RENAL DISEASE		1	0	0	0
		10%	0%	0%	0%
-MINERALIZATION		1	1	0	0
		10%	10%	0%	0%
-PYELONEPHRITIS		0	0	0	0
		0%	0%	0%	0%
-ONLY ONE KIDNEY EXAMINED		0	0	0	0
		0%	0%	0%	0%
URINARY BLADDER	NUMBER EXAMINED:	10	9	10	0
-NONNUCLEAR CELLULAR INFILTRATION		0	0	0	0
		0%	0%	0%	0%
UTERUS	NUMBER EXAMINED:				
ACCESSORY SEX OR	NUMBER EXAMINED:	10	2	1	10
-ADENITIS, SUBACUTE		0	0	0	0
		0%	0%	0%	0%

Table 4 (continued)

LETTERMAN ARMY INSTITUTE OF RESEARCH INCIDENCE SUMMARY (WITH %) OF MICROSCOPIC OBSERVATIONS(ALL FINDING)  
 DIV OF RES SUPP, PATH SERV GP  
 PRESIDIO OF SAN FRANCISCO, CA 94129  
 SPECIES: MOUSE/ICR  
 STUDY NUMBER: GLP86007  
 PATHOLOGIST(S): SMITH, CATHERINE D.  
 STUDY START DATE: 01-APR-87  
 PRINTED: 22-NOV-88  
 PAGE: 4

STUDY TYPE:

NOTES: ANIMALS = FINAL SACRIFICE		ANIMAL SEX:		AFFECTED	
CTLS = CONTROLS FROM GROUP(S): 1		MALES		FEMALES	
SUBGROUPS = 1 2		CTLS		CTLS	
TISUES WITH FINDINGS		NO. IN GROUP		NO. IN GROUP	
ACCESSORY SEX OR		NUMBER EXAMINED:		NUMBER EXAMINED:	
-DILATED DUCTS, PREPUTIAL GLANDS		0 1 1 2 0		0 1 1 2 0	
TESTES		10 2 0 10 0		10 2 0 10 0	
OVARIES		10 2 0 10 0		10 2 0 10 0	
-ONE OVARY MISSING AND/OR NOT EXAMINED		10 2 0 10 0		10 2 0 10 0	
-PARA-OVARIAN CYST(S)		0 0 0 0 0		0 0 0 0 0	
-FOLLICULAR CYST(S)		0 0 0 0 0		0 0 0 0 0	
DUODENUM		9 0 0 10 0		9 0 0 10 0	
JEJUNUM		10 0 0 10 0		10 0 0 10 0	
ILEUM		10 0 0 10 0		10 0 0 10 0	
PANCREAS		10 0 0 9 0		10 0 0 10 0	
-SUBACUTE PANCREATITIS		0 0 0 0 0		0 0 0 0 0	
CECUM		10 0 0 10 0		10 0 0 10 0	
RECTUM		9 1 0 8 0		9 0 0 10 0	
-DILATED DUCTS, SEBACEOUS GLANDS		0 0 0 1 0		0 0 0 1 0	
-SUPPURATIVE ADENITIS, SEBACEOUS GLAND		0 0 0 0 0		0 0 0 0 0	
COLON		10 1 0 10 0		10 0 0 10 0	

Table 4 (continued)

LETTERMAN ARMY INSTITUTE OF RESEARCH INCIDENCE SUMMARY (WITH %) OF MICROSCOPIC OBSERVATIONS(ALL FINDING) PRINTED: 22-NOV-88  
 DIV OF RES SUPP, PATH SERV GP STUDY NUMBER: GLP86007 PAGE: 5  
 PRESIDIO OF SAN FRANCISCO, CA 94129 PATHOLOGIST(S): SMITH, CATHERINE D.  
 SPECIES: MOUSE/ICR STUDY START DATE: 01-APR-87

STUDY TYPE:

NOTES: ANIMALS = FINAL SACRIFICE		-- ANIMALS		AFFECTED	
CTLS = CONTROLS FROM GROUP(S): 1		-- MALES		-- FEMALES	
SUBGROUPS = 1 2	ANIMAL SEX:	CTLS	DOSAGE GROUP:	CTLS	
TISSUES WITH FINDINGS	NO. IN GROUP:	10	10	10	10
		10	10	10	10
		0	0	0	0
		0%	0%	0%	0%
STOMACH	NUMBER EXAMINED:	10	1	0	10
-GLANDULAR CYST(S)		0	0	0	0
		0%	0%	0%	0%
SKELETAL MUSCLE	NUMBER EXAMINED:	9	1	0	10
-REGENERATION		0	0	0	0
		0%	0%	0%	0%
SCIATIC NERVE	NUMBER EXAMINED:	8	1	0	10
TONGUE	NUMBER EXAMINED:	9	1	0	9
SKIN	NUMBER EXAMINED:	10	1	0	9
MAMMARY GLAND	NUMBER EXAMINED:	4	0	0	3
-PHYSIOLOGICALLY "ACTIVE"		0	0	0	0
		0%	0%	0%	0%
BONE, STERNUM	NUMBER EXAMINED:	10	0	0	6
ADRENAL	NUMBER EXAMINED:	10	1	0	7
-NECROSIS, CORTICAL		1	0	0	0
		10%	0%	0%	0%
-CORTICAL CELL VACUOLIZATION		2	0	0	0
		20%	0%	0%	0%
-SUBCAPSULAR CELL HYPERPLASIA		3	0	0	5
		30%	0%	0%	71%
-ONLY ONE ADRENAL GLAND AVAILABLE FOR EXAMINATION		3	0	0	3
		30%	0%	0%	42%
-MEDULLARY CELL VACUOLATION		2	0	0	0
		20%	0%	0%	0%

Table 4 (continued)



LETTERMAN ARMY INSTITUTE OF RESEARCH INCIDENCE SUMMARY (WITH %) OF MICROSCOPIC OBSERVATIONS(ALL FINDING) PRINTED: 22-NOV-88  
 DIV OF RES SUPP, PATH SERV GP STUDY NUMBER: GLP86007 PAGE: 1  
 PRESIDIO OF SAN FRANCISCO, CA 94129 PATHOLOGIST(S): SMITH, CATHERINE D.  
 SPECIES: MOUSE/ICR STUDY START DATE: 01-APR-87

STUDY TYPE:

NOTES: ANIMALS = INTERIM SACRIFICE 1  
 CTLS = CONTROLS FROM GROUP(S): 1  
 SUBGROUPS = 1 2  
 T I S S U E S W I T H F I N D I N G S

--- ANIMALS AFFECTED ---  
 -- MALES -- -- FEMALES --  
 CTLS 2 3 4 5 CTLS 2 3 4 5

BRAIN	0	0	0	0	10	0	0	0	0	10
-HYDROCEPHALUS	0	0	0	0	0	0	0	0	0	0
	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
-FAT, CHOROID PLEXUS	0	0	0	0	0	0	0	0	0	1
	0%	0%	0%	0%	0%	0%	0%	0%	0%	10%
-HIPPOCAMPAL VACUOLATION	0	0	0	0	3	0	0	0	0	5
	0%	0%	0%	0%	30%	0%	0%	0%	0%	50%
TRACHEA	0	0	0	0	6	0	0	0	0	9
THYROID GLANDS	0	0	0	0	4	0	0	0	0	9
-COLLOID CYST(S)	0	0	0	0	0	0	0	0	0	0
	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
PARATHYROID	0	0	0	0	1	0	0	0	0	3
-C CELL HYPERPLASIA	0	0	0	0	0	0	0	0	0	0
	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
ESOPHAGUS	0	0	0	0	7	0	0	0	0	9
-MONONUCLEAR CELLULAR INFILTRATION	0	0	0	0	1	0	0	0	0	0
	0%	0%	0%	0%	14%	0%	0%	0%	0%	0%
PAROTID GLAND	0	0	0	0	3	0	0	0	0	9
-DUCTAL FIBROSIS	0	0	0	0	0	0	0	0	0	0
	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
-ADENITIS, SUBACUTE	0	0	0	0	0	0	0	0	0	0
	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
MANDIBULAR GLND	0	0	0	0	8	0	0	0	0	9
-ADENITIS, SUBACUTE	0	0	0	0	0	0	0	0	0	0
	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
-DUCTULAR FIBROSIS	0	0	0	0	0	0	0	0	0	0
	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Table 5

LETTERMAN ARMY INSTITUTE OF RESEARCH INCIDENCE SUMMARY (WITH %) OF MICROSCOPIC OBSERVATIONS(ALL FINDING) PRINTED: 22-NOV-88  
 DIV OF RES SUPP, PATH SERV GP STUDY NUMBER: GLP86007 PAGE: 2  
 PRESIDIO OF SAN FRANCISCO, CA 94129 PATHOLOGIST(S): SMITH, CATHERINE D.  
 SPECIES: MOUSE/ICR STUDY START DATE: 01-APR-87 STUDY TYPE:

NOTES: ANIMALS = INTERIM SACRIFICE 1											
CTLS = CONTROLS FROM GROUP(S): 1											
SUBGROUPS = 1 2											
T I S S U E S W I T H F I N D I N G S											
ANIMALS											
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FEMALES											
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Table 5 (continued)



LETTERMAN ARMY INSTITUTE OF RESEARCH INCIDENCE SUMMARY (WITH %) OF MICROSCOPIC OBSERVATIONS(ALL FINDING)  
 DIV OF RES SUPP, PATH SERV GP  
 PRESIDIO OF SAN FRANCISCO, CA 94129  
 SPECIES: MOUSE/ICR  
 STUDY NUMBER: GLP86007  
 PATHOLOGIST(S): SMITH, CATHERINE D.  
 STUDY START DATE: 01-APR-87  
 PRINTED: 22-NOV-88  
 PAGE: 3

STUDY TYPE:

	-- ANIMALS AFFECTED --									
	MALES					FEMALES				
	CTLS	2	3	4	5	CTLS	2	3	4	5
TISSUES WITH FINDINGS	NO. IN GROUP									
NOTES: ANIMALS = INTERIM SACRIFICE 1										
CTLS = CONTROLS FROM GROUP(S): 1										
SUBGROUPS = 1 2										
ANIMAL SEX:										
DOSAGE GROUP:										
NO. IN GROUP:										
NUMBER EXAMINED:										
MESENTERIC LYMPH N	0	0	0	0	6	0	0	0	0	9
-COMPOSITE LYMPHOMA	0	0	0	0	0	0	0	0	0	0
	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
-ERYTHROPHAGOCYTOSIS	0	0	0	0	0	0	0	0	0	0
	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
GALL BLADDER	0	0	0	0	3	0	0	0	0	9
KIDNEY	0	0	0	0	10	0	0	0	0	10
-LYMPHOCYTES, INTERSTITIAL	0	0	0	0	1	0	0	0	0	1
	0%	0%	0%	0%	10%	0%	0%	0%	0%	10%
-CORTICAL CYSTS	0	0	0	0	0	0	0	0	0	0
	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
-HYDRONEPHROSIS	0	0	0	0	0	0	0	0	0	0
	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
-PROGRESSIVE RENAL DISEASE	0	0	0	0	1	0	0	0	0	0
	0%	0%	0%	0%	10%	0%	0%	0%	0%	0%
-MINERALIZATION	0	0	0	0	2	0	0	0	0	0
	0%	0%	0%	0%	20%	0%	0%	0%	0%	0%
-PYELONEPHRITIS	0	0	0	0	0	0	0	0	0	0
	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
-ONLY ONE KIDNEY EXAMINED	0	0	0	0	1	0	0	0	0	0
	0%	0%	0%	0%	10%	0%	0%	0%	0%	0%
URINARY BLADDER	0	0	0	0	8	0	0	0	0	8
-MONONUCLEAR CELLULAR INFILTRATION	0	0	0	0	0	0	0	0	0	0
	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
UTERUS	0	0	0	0	10	0	0	0	0	10
ACCESSORY SEX OR	0	0	0	0	0	0	0	0	0	0
-ADENITIS, SUBACUTE	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Table 5 (continued)

PRINTED: 22-NOV-88  
PAGE: 4

# LETTERMAN ARMY INSTITUTE OF RESEARCH INCIDENCE SUMMARY (WITH %) OF MICROSCOPIC OBSERVATIONS(ALL FINDING)

DIV OF RES SUPP, PATH SERV GP  
PRESIDIO OF SAN FRANCISCO, CA 94129  
SPECIES: MOUSE/ICR

STUDY NUMBER: GLP86007

PATHOLOGIST(S): SMITH, CATHERINE D.

STUDY START DATE: 01-APR-87

STUDY TYPE:

NOTES: ANIMALS = INTERIM SACRIFICE 1

CTLS = CONTROLS FROM GROUP(S): 1

SUBGROUPS = 1 2

T I S S U E S W I T H F I N D I N G S

ANIMAL SEX OR

ACCESSORY SEX OR

-DILATED DUCTS, PREPUTIAL GLANDS

NUMBER EXAMINED:

0 0 0 0 0 9

TESTES

NUMBER EXAMINED:

0 0 0 0 0 9

OVARIES

NUMBER EXAMINED:

0 0 0 0 0 9

-ONE OVARY MISSING AND/OR NOT EXAMINED

0 0 0 0 0 9

-PARA-OVARIAN CYST(S)

0 0 0 0 0 9

-FOLLICULAR CYST(S)

0 0 0 0 0 9

0 0 0 0 0 9

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Table 5 (continued)

LETTERMAN ARMY INSTITUTE OF RESEARCH INCIDENCE SUMMARY (WITH %) OF MICROSCOPIC OBSERVATIONS(ALL FINDING) PRINTED: 22-NOV-88  
 DIV OF RES SUPP, PATH SERV GP STUDY NUMBER: GLP86007 PAGE: 5  
 PRESIDIO OF SAN FRANCISCO, CA 94129 PATHOLOGIST(S): SMITH, CATHERINE D.  
 SPECIES: MOUSE/ICR STUDY START DATE: 01-APR-87 STUDY TYPE:

NOTES: ANIMALS = INTERIM SACRIFICE 1		-- ANIMALS AFFECTED --			
CTLS = CONTROLS FROM GROUP(S): 1	ANIMAL SEX:	-- MALES --		-- FEMALES --	
SUBGROUPS = 1 2	DOSAGE GROUP:	CTLS	2 3 4 5	CTLS	2 3 4 5
T I S S U E S W I T H F I N D I N G S	NO. IN GROUP:	0 0 0 0 10	0 0 0 0 10	0 0 0 0 10	0 0 0 0 10
STOMACH .....	NUMBER EXAMINED:	0 0 0 0 9	0 0 0 0 9	0 0 0 0 9	0 0 0 0 10
-GLANDULAR CYST(S)		0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0
		0% 0% 0% 0% 0%	0% 0% 0% 0% 0%	0% 0% 0% 0% 0%	0% 0% 0% 0% 0%
SKELETAL MUSCLE .....	NUMBER EXAMINED:	0 0 0 0 10	0 0 0 0 10	0 0 0 0 10	0 0 0 0 10
-REGENERATION		0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 1
		0% 0% 0% 0% 0%	0% 0% 0% 0% 0%	0% 0% 0% 0% 0%	0% 0% 0% 0% 10%
SCIATIC NERVE .....	NUMBER EXAMINED:	0 0 0 0 10	0 0 0 0 10	0 0 0 0 10	0 0 0 0 6
TONGUE .....	NUMBER EXAMINED:	0 0 0 0 9	0 0 0 0 9	0 0 0 0 9	0 0 0 0 9
SKIN .....	NUMBER EXAMINED:	0 0 0 0 10	0 0 0 0 10	0 0 0 0 10	0 0 0 0 10
MAMMARY GLAND .....	NUMBER EXAMINED:	0 0 0 0 4	0 0 0 0 4	0 0 0 0 4	0 0 0 0 9
-PHYSIOLOGICALLY "ACTIVE"		0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 0
		0% 0% 0% 0% 0%	0% 0% 0% 0% 0%	0% 0% 0% 0% 0%	0% 0% 0% 0% 0%
BONE, STERNUM .....	NUMBER EXAMINED:	0 0 0 0 10	0 0 0 0 10	0 0 0 0 10	0 0 0 0 9
ADRENAL .....	NUMBER EXAMINED:	0 0 0 0 10	0 0 0 0 10	0 0 0 0 10	0 0 0 0 7
-NECROSIS, CORTICAL		0 0 0 0 3	0 0 0 0 3	0 0 0 0 3	0 0 0 0 2
		0% 0% 0% 0% 30%	0% 0% 0% 0% 30%	0% 0% 0% 0% 30%	0% 0% 0% 0% 28%
-CORTICAL CELL VACUOLIZATION		0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 1
		0% 0% 0% 0% 0%	0% 0% 0% 0% 0%	0% 0% 0% 0% 0%	0% 0% 0% 0% 14%
-SUBCAPSULAR CELL HYPERPLASIA		0 0 0 0 2	0 0 0 0 2	0 0 0 0 2	0 0 0 0 0
		0% 0% 0% 0% 20%	0% 0% 0% 0% 20%	0% 0% 0% 0% 20%	0% 0% 0% 0% 0%
-ONLY ONE ADRENAL GLAND AVAILABLE FOR EXAMINATION		0 0 0 0 2	0 0 0 0 2	0 0 0 0 2	0 0 0 0 3
		0% 0% 0% 0% 20%	0% 0% 0% 0% 20%	0% 0% 0% 0% 20%	0% 0% 0% 0% 42%
-MEDULLARY CELL VACUOLATION		0 0 0 0 0	0 0 0 0 0	0 0 0 0 0	0 0 0 0 1
		0% 0% 0% 0% 0%	0% 0% 0% 0% 0%	0% 0% 0% 0% 0%	0% 0% 0% 0% 14%

Table 5 (continued)

LETTERMAN ARMY INSTITUTE OF RESEARCH INCIDENCE SUMMARY (WITH %) OF MICROSCOPIC OBSERVATIONS(ALL FINDING) PRINTED: 22-NOV-88  
 DIV OF RES SUPP, PATH SERV GP STUDY NUMBER: GLP86007 PAGE: 6  
 PRESIDIO OF SAN FRANCISCO, CA 94129 PATHOLOGIST(S): SMITH, CATHERINE D.  
 SPECIES: MOUSE/ICR STUDY START DATE: 01-APR-87 STUDY TYPE:

NOTES: ANIMALS = INTERIM SACRIFICE 1		--- ANIMALS AFFECTED ---			
CTLS = CONTROLS FROM GROUP(S): 1		--- MALES ---		--- FEMALES ---	
SUBGROUPS = 1 2		CTLS 2 3 4 5		CTLS 2 3 4 5	
T I S S U E S W I T H F I N D I N G S		NO. IN GROUP: 0 0 0 0 10		0 0 0 0 10	
PITUITARY GLAND	NUMBER EXAMINED:	0	0	0	0
EYES & OPTIC N.	NUMBER EXAMINED:	0	0	0	0
-BILATERAL RETINAL DEGENERATION AND/OR ATROPHY		0	0	0	0
		0%	0%	0%	0%
-ONLY ONE EYE EXAMINED		0	0	0	0
		0%	0%	0%	0%
LIVER	NUMBER EXAMINED:	0	0	0	0
-EXTRAMEDULLARY HEMATOPOIESIS		0	0	0	0
		0%	0%	0%	0%
-PERIportal MONONuclear CELLULAR INFILTRATION		0	0	0	0
		0%	0%	0%	0%
-GRANULOMA		0	0	0	0
		0%	0%	0%	0%
-MICROABSCESSES(ES)		0	0	0	0
		0%	0%	0%	0%
-IDIOPATHIC FOCI OF BASOPHILIC, EOSINOPHILIC, VACUOLATED, AND/OR PLEOMORPHIC HEPATOCYTES		0	0	0	0
		0%	0%	0%	0%
HARDERIAN GLAND	NUMBER EXAMINED:	0	0	0	0
-PORPHYRIN PIGMENT		0	0	0	0
		0%	0%	0%	0%

Table 5 (continued)

LETTERMAN ARMY INSTITUTE OF RESEARCH INCIDENCE SUMMARY (WITH %) OF MICROSCOPIC OBSERVATIONS(ALL FINDING) PRINTED: 22-NOV-88  
 DIV OF RES SUPP, PATH SERV GP STUDY NUMBER: GLP86007 PAGE: 1  
 PRESIDIO OF SAN FRANCISCO, CA 94129 PATHOLOGIST(S): SMITH, CATHERINE D.  
 SPECIES: MOUSE/ICR STUDY START DATE: 01-APR-87

NOTES: ANIMALS = INTERIM SACRIFICE 2 -- ANIMALS AFFECTED --  
 CTLS = CONTROLS FROM GROUP(S): 1 ANIMAL SEX: -- MALES -- FEMALES --  
 SUBGROUPS = 1 2 DOSAGE GROUP: CTLS 2 3 4 5 CTLS 2 3 4 5  
 T I S S U E S W I T H F I N D I N G S NO. IN GROUP: 5 5 5 5 0 5 5 5 5 0 STUDY TYPE:

BRAIN .....	5	4	4	5	0	5	5	5	5	0
-HYDROCEPHALUS	0	0	0	0	0	0	0	0	0	0
	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
-FAT, CHOROID PLEXUS	0	0	0	0	0	0	0	0	1	0
	0%	0%	0%	0%	0%	0%	0%	0%	20%	0%
-HIPPOCAMPAL VACUOLATION	1	0	1	1	0	1	0	1	2	0
	20%	0%	25%	20%	0%	20%	0%	20%	40%	0%
TRACHEA .....	5	0	0	5	0	5	0	0	5	0
NUMBER EXAMINED:	5	0	0	5	0	5	0	0	5	0
THYROID GLANDS .....	5	0	0	5	0	5	0	0	5	0
-COLLOID CYST(S)	0	0	0	0	0	0	0	0	0	0
	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
PARATHYROID .....	1	0	0	2	0	1	0	0	4	0
-C CELL HYPERPLASIA	0	0	0	0	0	0	0	0	0	0
	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
ESOPHAGUS .....	5	0	0	5	0	5	0	0	5	0
-MONONUCLEAR CELLULAR INFILTRATION	0	0	0	0	0	0	0	0	0	0
	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
PAROTID GLAND .....	4	0	0	4	0	4	0	0	4	0
-DUCTAL FIBROSIS	0	0	0	1	0	0	0	0	0	0
	0%	0%	0%	25%	0%	0%	0%	0%	0%	0%
-ADENITIS, SUBACUTE	0	0	0	0	0	0	0	0	0	0
	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
MANDIBULAR GLND .....	5	0	0	5	0	5	0	0	4	0
-ADENITIS,SUBACUTE	0	0	0	0	0	0	0	0	1	0
	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%
-DUCTULAR FIBROSIS	0	0	0	0	0	0	0	0	1	0
	0%	0%	0%	0%	0%	0%	0%	0%	25%	0%

Table 6

LETTERMAN ARMY INSTITUTE OF RESEARCH INCIDENCE SUMMARY (WITH %) OF MICROSCOPIC OBSERVATIONS(ALL FINDING) PRINTED: 22-NOV-88  
 DIV OF RES SUPP, PATH SERV GP STUDY NUMBER: GLP86007 PAGE: 2  
 PRESIDIO OF SAN FRANCISCO, CA 94129 PATHOLOGIST(S): SMITH, CATHERINE D.  
 SPECIES: MOUSE/ICR STUDY START DATE: 01-APR-87 STUDY TYPE:

NOTES: ANIMALS = INTERIM SACRIFICE 2		--- ANIMALS AFFECTED ---		--- FEMALES ---	
CTLS = CONTROLS FROM GROUP(S): 1		--- MALES ---		--- FEMALES ---	
SUBGROUPS = 1 2		CTLS 2 3 4 5		CTLS 2 3 4 5	
T I S S U E S W I T H F I N D I N G S		NO. IN GROUP: 5 5 5 0		NO. IN GROUP: 5 5 5 0	
SUB-LINGUAL GLND		NUMBER EXAMINED: 5 0 0 4 0		NUMBER EXAMINED: 5 0 0 4 0	
EXORBITAL LACRIM		NUMBER EXAMINED: 4 0 0 4 0		NUMBER EXAMINED: 4 0 0 4 0	
-ADENITIS, SUBACUTE		0 0 0 0 0		1 0 0 0 0	
		0% 0% 0% 0% 0%		25% 0% 0% 0% 0%	
HEART		NUMBER EXAMINED: 5 0 0 5 0		NUMBER EXAMINED: 4 0 0 5 0	
AORTA		NUMBER EXAMINED: 4 0 0 5 0		NUMBER EXAMINED: 5 0 0 2 0	
LUNGS		NUMBER EXAMINED: 5 5 5 5 0		NUMBER EXAMINED: 5 5 5 5 0	
-PERIVASCULAR LYMPHOID AGGREGATIONS (CUFFING)		1 1 0 2 0		0 0 1 4 0	
		20% 20% 0% 40% 0%		0% 0% 20% 80% 0%	
-VASCULAR CONGESTION		0 0 0 0 0		0 1 0 0 0	
		0% 0% 0% 0% 0%		0% 20% 0% 0% 0%	
-ADENOMATOUS HYPERPLASIA OF THE ALVEOLAR EPITHELIAL CELLS (ADENOMATOSIS)		0 0 0 0 0		0 0 0 0 0	
		0% 0% 0% 0% 0%		0% 0% 0% 0% 0%	
-B- ALVEOLAR CELL ADENOMA		0 0 0 0 0		0 0 0 0 0	
		0% 0% 0% 0% 0%		0% 0% 0% 0% 0%	
THYMUS		NUMBER EXAMINED: 5 0 0 5 0		NUMBER EXAMINED: 4 0 0 5 0	
-CYST(S)		1 0 0 0 0		0 0 0 0 0	
		20% 0% 0% 0% 0%		0% 0% 0% 0% 0%	
SPLEEN		NUMBER EXAMINED: 5 0 1 5 0		NUMBER EXAMINED: 5 0 0 5 0	
-EXTRAMEDULLARY HEMATOPOIESIS		4 0 1 5 0		5 0 0 5 0	
		80% 0% 100% 100% 0%		100% 0% 0% 100% 0%	
-MYELOID HYPERPLASIA		0 0 1 0 0		0 0 0 0 0	
		0% 0% 100% 0% 0%		0% 0% 0% 0% 0%	
MESENTERIC LYMPH		NUMBER EXAMINED: 3 0 0 4 0		NUMBER EXAMINED: 4 0 0 4 0	
-SINUS HISTIOCYTOSIS		3 0 0 2 0		4 0 0 4 0	
		100% 0% 0% 50% 0%		100% 0% 0% 100% 0%	

Table 6 (continued)

LETTERMAN ARMY INSTITUTE OF RESEARCH INCIDENCE SUMMARY (WITH %) OF MICROSCOPIC OBSERVATIONS(ALL FINDING) PRINTED: 22-NOV-88  
 DIV OF RES SUPP, PATH SERV GP STUDY NUMBER: GLP86007 PAGE: 3  
 PRESIDIO OF SAN FRANCISCO, CA 94129 PATHOLOGIST(S): SMITH, CATHERINE D.  
 SPECIES: MOUSE/ICR STUDY START DATE: 01-APR-87 STUDY TYPE:

NOTES: ANIMALS = INTERIM SACRIFICE 2		--- ANIMALS ---		AFFECTED	
CTLS = CONTROLS FROM GROUP(S): 1		--- MALES ---		--- FEMALES ---	
SUBGROUPS = 1 2		CTLS		CTLS	
T I S S U E S W I T H F I N D I N G S		5 5 5 0		5 5 5 0	
NO. IN GROUP:		5 5 5 0		5 5 5 0	
NUMBER EXAMINED:		3 0 0 4 0		4 0 0 4 0	
-COMPOSITE LYMPHOMA		0 0 0 0 0		0 0 0 0 0	
-ERYTHROPHAGOCYTOSIS		0% 0% 0% 0% 0%		0% 0% 0% 0% 0%	
GALL BLADDER		3 3 3 3 0		4 4 4 4 0	
KIDNEY		5 5 5 5 0		5 5 5 5 0	
-LYMPHOCYTES, INTERSTITIAL		1 4 1 0 0		1 2 1 1 0	
-CORTICAL CYSTS		20% 80% 20% 0% 0%		20% 40% 20% 20% 0%	
-HYDRONEPHROSIS		0 0 0 0 0		0 0 0 0 0	
-PROGRESSIVE RENAL DISEASE		0 0 0 0 0		0 0 0 0 0	
-MINERALIZATION		0 0 0 0 0		0 0 0 0 0	
-PYELONEPHRITIS		0 0 1 0 0		0 0 0 0 0	
-ONLY ONE KIDNEY EXAMINED		0 0 0 0 0		0 0 0 0 0	
URINARY BLADDER		4 3 5 4 0		5 4 4 5 0	
-MONONUCLEAR CELLULAR INFILTRATION		0 0 0 0 0		0 0 0 0 0	
UTERUS		0 0 0 0 0		0 0 0 0 0	
ACCESSORY SEX OR		5 0 0 5 0		5 0 0 5 0	
-ADENITIS, SUBACUTE		0 0 0 1 0		0 0 0 0 0	
NUMBER EXAMINED:		0% 0% 0% 20% 0%		0% 0% 0% 20% 0%	

Table 6 (continued)

PRINTED: 22-NOV-88  
PAGE: 4

LETTERMAN ARMY INSTITUTE OF RESEARCH INCIDENCE SUMMARY (WITH %) OF MICROSCOPIC OBSERVATIONS(ALL FINDING)

DIV OF RES SUPP, PATH SERV GP  
PRESIDIO OF SAN FRANCISCO, CA 94129  
STUDY NUMBER: GLP86007  
PATHOLOGIST(S): SMITH, CATHERINE D.  
STUDY START DATE: 01-APR-87  
SPECIES: MOUSE/ICR

STUDY TYPE:

NOTES: ANIMALS = INTERIM SACRIFICE 2  
CTLS = CONTROLS FROM GROUP(S): 1  
SUBGROUPS = 1 2  
T I S S U E S W I T H F I N D I N G S

ANIMALS AFFECTED  
-- MALES -- FEMALES --  
CTLS 2 3 4 5 CTLS 2 3 4 5  
NO. IN GROUP: 5 5 5 0 5 5 5 0

ACCESSORY SEX OR ..... NUMBER EXAMINED: 5 0 0 5 0  
-DILATED DUCTS, PREPUTIAL GLANDS  
0 0 0 0 0 0  
0% 0% 0% 0% 0% 0%

TESTES ..... NUMBER EXAMINED: 5 0 0 5 0  
OVARIES ..... NUMBER EXAMINED:  
-ONE OVARY MISSING AND/OR NOT EXAMINED

-PARA-OVARIAN CYST(S)  
5 0 1 4 0  
1 0 0 0 0  
20% 0% 0% 0% 0%  
-FOLLICULAR CYST(S)  
0 0 1 0 0  
0% 0% 100% 0% 0%  
0 0 0 0 0  
0% 0% 0% 0% 0%

DUODENUM ..... NUMBER EXAMINED: 5 0 0 5 0  
JEJUNUM ..... NUMBER EXAMINED: 5 0 0 5 0  
ILEUM ..... NUMBER EXAMINED: 5 0 0 5 0  
PANCREAS ..... NUMBER EXAMINED: 5 0 0 5 0  
-SUBACUTE PANCREATITIS  
0 0 0 0 0  
0% 0% 0% 0% 0%

CECUM ..... NUMBER EXAMINED: 5 0 0 5 0  
RECTUM ..... NUMBER EXAMINED: 5 0 0 5 0  
-DILATED DUCTS, SEBACEOUS GLANDS  
0 0 0 0 0  
0% 0% 0% 0% 0%

-SUPPURATIVE ADENITIS, SEBACEOUS GLAND  
0 0 0 0 0  
0% 0% 0% 0% 0%  
COLON ..... NUMBER EXAMINED: 5 0 0 5 0

Table 6 (continued)





LETTERMAN ARMY INSTITUTE OF RESEARCH INCIDENCE SUMMARY (WITH %) OF MICROSCOPIC OBSERVATIONS(ALL FINDING)																																																	
DIV OF RES SUPP, PATH SERV GP																																																	
STUDY NUMBER: GLP86007																																																	
PATHOLOGIST(S): SMITH, CATHERINE D.																																																	
STUDY START DATE: 01-APR-87																																																	
SPECIES: MOUSE/ICR																																																	
NOTES: ANIMALS = INTERIM SACRIFICE 2																																																	
CTLS = CONTROLS FROM GROUP(S): 1																																																	
SUBGROUPS = 1 2																																																	
T I S S U E S W I T H F I N D I N G S																																																	
<table> <tr> <td colspan="2"></td><td colspan="2">-- ANIMALS</td><td colspan="2">A F F E C T E D</td><td colspan="2"></td><td colspan="2"></td></tr> <tr> <td colspan="2"></td><td colspan="2">-- MALES</td><td colspan="2">-- FEMALES</td><td colspan="2"></td><td colspan="2"></td></tr> <tr> <td>CTLS</td><td>2</td><td>3</td><td>4</td><td>5</td><td>CTLS</td><td>2</td><td>3</td><td>4</td><td>5</td></tr> <tr> <td>NO. IN GROUP:</td><td>5</td><td>5</td><td>5</td><td>0</td><td></td><td>5</td><td>5</td><td>5</td><td>0</td></tr> </table>												-- ANIMALS		A F F E C T E D								-- MALES		-- FEMALES						CTLS	2	3	4	5	CTLS	2	3	4	5	NO. IN GROUP:	5	5	5	0		5	5	5	0
		-- ANIMALS		A F F E C T E D																																													
		-- MALES		-- FEMALES																																													
CTLS	2	3	4	5	CTLS	2	3	4	5																																								
NO. IN GROUP:	5	5	5	0		5	5	5	0																																								
STUDY TYPE:																																																	
PITUITARY GLAND																																																	
NUMBER EXAMINED:																																																	
EYES & OPTIC N.																																																	
NUMBER EXAMINED:																																																	
-BILATERAL RETINAL DEGENERATION AND/OR ATROPHY																																																	
-ONLY ONE EYE EXAMINED																																																	
LIVER																																																	
-EXTRAMEDULLARY HEMATOPOIESIS																																																	
NUMBER EXAMINED:																																																	
-PERIportal MONONUCLEAR CELLULAR INFILTRATION																																																	
-GRANULOMA																																																	
-MICROABSCESSES(ES)																																																	
-IDIOPATHIC FOCI OF BASOPHILIC, EOSINOPHILIC, VACUOLATED, AND/OR PLEOMORPHIC HEPATOCYTES																																																	
HARDERIAN GLAND																																																	
-PORPHYRIN PIGMENT																																																	

Table 6 (continued)

LETTERMAN ARMY INSTITUTE OF RESEARCH  
 DIV OF RES SUPP, PATH SERV GP  
 PRESIDIO OF SAN FRANCISCO, CA 94129  
 SPECIES: MOUSE/ICR

INCIDENCE SUMMARY OF MICROSCOPIC OBSERVATIONS(ALL FINDING)  
 STUDY NUMBER: GLP86007  
 PATHOLOGIST(S): SMITH, CATHERINE D.  
 STUDY START DATE: 01-APR-87

PRINTED: 22-NOV-88  
 PAGE: 1

STUDY TYPE:

NOTES: ANIMALS = ALL DEAD		AFFECTED									
CTLS = CONTROLS FROM GROUP(S): 1		ANIMALS					AFFECTED				
SUBGROUPS = 1 2		MALES					FEMALES				
T I S S U E S W I T H F I N D I N G S		CTLS	2	3	4	5	CTLS	2	3	4	5
		NO. IN GROUP:	15	15	15	10	15	15	15	15	10
		NUMBER EXAMINED:	15	14	14	15	10	15	13	14	15
BRAIN			0	0	0	0	0	0	0	0	0
-HYDROCEPHALUS			0	0	0	0	0	0	0	0	0
-FAT, CHOROID PLEXUS			0	0	0	0	0	0	0	0	1
-HIPPOCAMPAL VACUOLATION			1	0	1	1	3	1	0	1	3
TRACHEA			15	0	0	15	6	15	0	0	15
THYROID GLANDS			15	0	0	14	4	13	0	0	15
-COLLOID CYST(S)			0	0	0	0	0	0	0	0	1
PARATHYROID			5	0	0	6	1	5	0	0	6
-C CELL HYPERPLASIA			0	0	0	1	0	0	0	0	0
ESOPHAGUS			15	0	0	15	7	15	0	0	15
-MONONUCLEAR CELLULAR INFILTRATION			0	0	0	0	1	0	0	0	0
PAROTID GLAND			11	0	0	10	3	13	0	0	12
-DUCTAL FIBROSIS			0	0	0	1	0	0	0	0	0
-ADENITIS, SUBACUTE			0	0	0	0	0	1	0	0	0
MANDIBULAR GLND			15	1	0	15	8	15	0	0	13
-ADENITIS, SUBACUTE			1	0	0	3	0	1	0	0	1
-DUCTULAR FIBROSIS			0	0	0	0	0	0	0	0	1
SUB-LINGUAL GLND			15	1	0	14	9	15	0	0	13
EXORBITAL LACRIM			13	0	0	11	6	13	0	0	6
-ADENITIS, SUBACUTE			4	0	0	2	0	1	0	0	0
HEART			15	1	0	15	9	14	0	0	15
AORTA			11	0	0	13	2	13	0	0	9
LUNGS			15	15	15	15	10	15	15	15	8
-PERIVASCULAR LYMPHOID AGGREGATIONS (CUFFING)			1	3	2	5	0	3	1	2	5
-VASCULAR CONGESTION			0	4	1	0	0	0	3	0	0
-ADENOMATOUS HYPERPLASIA OF THE ALVEOLAR EPITHELIAL CELLS (ADENOMATOSIS)			0	0	0	0	0	0	0	0	0
-B- ALVEOLAR CELL ADENOMA			0	0	1	0	0	0	0	0	0

NOTE: ENTRIES FLAGGED WITH A - (MINUS) ARE SIGNIFICANTLY DIFFERENT FROM CONTROL AT THE 0.05 LEVEL USING KOLMOGOROV-SMIRNOV TWO-TAILED TEST.

Table 7

LETTERMAN ARMY INSTITUTE OF RESEARCH  
DIV OF RES SUPP, PATH SERV GP  
PRESIDIO OF SAN FRANCISCO, CA 94129  
SPECIES: MOUSE/ICR

## INCIDENCE SUMMARY OF MICROSCOPIC OBSERVATIONS(ALL FINDING)

PRINTED: 22-NOV-88  
PAGE: 2

STUDY NUMBER: GLP86007  
PATHOLOGIST(S): SMITH, CATHERINE D.  
STUDY START DATE: 01-APR-87

STUDY TYPE:

NOTES: ANIMALS = ALL DEAD												
CTLS = CONTROLS FROM GROUP(S): 1												
SUBGROUPS = 1 2												
T I S S U E S    W I T H    F I N D I N G S												
ANIMALS												
A F F E C T E D												
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NOTE: ENTRIES FLAGGED WITH A - (MINUS) ARE SIGNIFICANTLY DIFFERENT FROM CONTROL AT THE 0.05 LEVEL USING KOLMOGOROV-SMIRNOV TWO-TAILED TEST.

Table 7 (continued)

LETTERMAN ARMY INSTITUTE OF RESEARCH  
 DIV OF RES SUPP, PATH SERV GP  
 PRESIDIO OF SAN FRANCISCO, CA 94129  
 SPECIES: MOUSE/ICR

INCIDENCE SUMMARY OF MICROSCOPIC OBSERVATIONS(CALL FINDING)

STUDY NUMBER: GLP86007  
 PATHOLOGIST(S): SMITH, CATHERINE D.  
 STUDY START DATE: 01-APR-87

PRINTED: 22-NOV-88  
 PAGE: 3

STUDY TYPE:

NOTES: ANIMALS = ALL DEAD		ANIMAL SEX:		AFFECTED	
CTLS = CONTROLS FROM GROUP(S): 1		-- MALES --		-- FEMALES --	
SUBGROUPS = 1 2		CTLS	2	3	4
T I S S U E S		15	15	15	15
W I T H		F I N D I N G S	5	10	10



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 SPECIES: MOUSE/ICR

CORRELATION OF GROSS AND MICROSCOPIC FINDINGS  
 STUDY NUMBER: GLP86007  
 PATHOLOGIST(S): SMITH, CATHERINE D.  
 STUDY START DATE: 01-APR-87

PRINTED: 09-AUG-88  
 PAGE: 6

ANIMAL NUMBER: 87C0083  
 DATE OF DEATH: 01-JUL-87  
 SEX: MALE  
 STUDY DAY OF DEATH: 92  
 DOSE GROUP: 1  
 STUDY WEEK OF DEATH: 14  
 SACRIFICE STATUS: FINAL SACRIFICE  
 TERMINAL BODY WEIGHT: 44.00 (GMS)

STUDY TYPE:

ORGAN NAME  
 HARDERIAN GLAND  
 \*GROSS: (TRACE) MULTIFOCAL BLACK SPECKLING  
 \*MICRO: NOT SPECIFIED(MILD)

<< P A T H O L O G Y O B S E R V A T I O N S >>  
 GROSS FREE-TEXT COMMENTS / HISTOPATHOLOGIC FINDINGS  
 PORPHYRIN PIGMENT

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 PRESIDIO OF SAN FRANCISCO, CA 94129  
 SPECIES: MOUSE/ICR

CORRELATION OF GROSS AND MICROSCOPIC FINDINGS  
 STUDY NUMBER: GLP86007  
 PATHOLOGIST(S): SMITH, CATHERINE D.  
 STUDY START DATE: 01-APR-87

PRINTED: 09-AUG-88  
 PAGE: 8

STUDY TYPE:

ANIMAL NUMBER: 87C0040  
 DATE OF DEATH: 01-JUL-87  
 SEX: MALE  
 STUDY DAY OF DEATH: 92  
 DOSE GROUP: 2  
 STUDY WEEK OF DEATH: 14  
 SACRIFICE STATUS: FINAL SACRIFICE  
 TERMINAL BODY WEIGHT: 38.00 (GMS)

ORGAN NAME  
 KEYWORDS / DISTRIBUTION (SEVERITY)

ACCESSORY SEX OR  
 \*GROSS: (MILD) ENLARGED.2.PREPUTIAL GLAND  
 (TRACE) ABNORMAL COLOR  
 \*MICRO: NOT SPECIFIED(TRACE)

PREPUTIAL GLAND  
 DILATED DUCTS, PREPUTIAL GLANDS

GROSS FREE-TEXT COMMENTS / HISTOPATHOLOGIC FINDINGS



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 SPECIES: MOUSE/ICR

CORRELATION OF GROSS AND MICROSCOPIC FINDINGS  
 STUDY NUMBER: GLP86007  
 PATHOLOGIST(S): SMITH, CATHERINE D.  
 STUDY START DATE: 01-APR-87

PRINTED: 09-AUG-88  
 PAGE: 9

STUDY TYPE:

ANIMAL NUMBER: 87C0063  
 DATE OF DEATH: 01-JUL-87  
 STUDY DAY OF DEATH: 92  
 SEX: MALE  
 DOSE GROUP: 2  
 SACRIFICE STATUS: FINAL SACRIFICE  
 STUDY WEEK OF DEATH: 14  
 TERMINAL BODY WEIGHT: 41.00 (GMS)

ORGAN NAME      KEYWORDS / DISTRIBUTION (SEVERITY)      GROSS FREE-TEXT COMMENTS / HISTOPATHOLOGIC FINDINGS

TESTES      <<    P A T H O L O G Y    O B S E R V A T I O N S    >>

\*GROSS: (MILD) ATROPHIC / SMALL, UNILATERALLY      THE LEFT TE IS ONE THIRD THE SIZE OF THE RIGHT.  
 \*MICRO: NONE

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 SPECIES: MUSE/ICR

CORRELATION OF GROSS AND MICROSCOPIC FINDINGS  
 STUDY NUMBER: GLP86007  
 PATHOLOGIST(S): SMITH, CATHERINE D.  
 STUDY START DATE: 01-APR-87

PRINTED: 09-AUG-88  
 PAGE: 14

ANIMAL NUMBER: 87C0033  
 DATE OF DEATH: 13-MAY-87  
 SEX: MALE  
 STUDY DAY OF DEATH: 43  
 DOSE GROUP: 3  
 STUDY WEEK OF DEATH: 7  
 SACRIFICE STATUS: INTERIM SACRIFICE 2  
 TERMINAL BODY WEIGHT: 35.00 (GMS)

STUDY TYPE:

ORGAN NAME      KEYWORDS / DISTRIBUTION (SEVERITY)      OBSERVATIONS / HISTOPATHOLOGIC FINDINGS

ACCESSORY SEX OR  
 \*GROSS: (MILD) 1X1CM VENT SEMINAL VESICLE  
 \*W:CRO: NONE

KIDNEY  
 \*GROSS: PYELONEPHRITIS  
 \*W:CRO: DIFFUSE(MODERATE)  
 LEFT KIDNEY HALF NORMAL SIZE-APPEARANCE PALE 1/3X 1/3 CM.  
 PYELONEPHRITIS

SPLEEN  
 \*GROSS: ENLARGED (SPLENO-MEGALY)  
 \*W:CRO: NOT SPECIFIED(TRACE)  
 NOT SPECIFIED(MARKED)  
 3X NORMAL SIZE  
 EXTRAMEDULLARY HEMATOPOIESIS  
 MYELOID HYPERPLASIA

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 SPECIES: MOUSE/ICR

CORRELATION OF GROSS AND MICROSCOPIC FINDINGS  
 STUDY NUMBER: GLP86007  
 PATHOLOGIST(S): SMITH, CATHERINE D.  
 STUDY START DATE: 01-APR-87

PRINTED: 09-AUG-88  
 PAGE: 16

ANIMAL NUMBER: 87C0044  
 DATE OF DEATH: 01-JUL-87  
 SEX: MALE  
 STUDY DAY OF DEATH: 92  
 DOSE GROUP: 3  
 STUDY WEEK OF DEATH: 14  
 SACRIFICE STATUS: FINAL SACRIFICE  
 TERMINAL BODY WEIGHT: 43.00 (GMS)

STUDY TYPE:

ORGAN NAME  
 ACCESSORY SEX OR  
 \*GROSS:  
 \*MICRO:

KEYWORDS / DISTRIBUTION (SEVERITY)  
 << P A T H O L O G Y O B S E R V A T I O N S >>  
 GROSS FREE-TEXT COMMENTS / HISTOPATHOLOGIC FINDINGS  
 PREPUTIAL GLAND  
 DILATED DUCTS, PREPUTIAL GLANDS  
 (MILD) ENLARGED.2-PREPUTIAL GLAND  
 (TRACE) ABNORMAL COLOR CENTRAL PALOR  
 NOT SPECIFIED(MILD)

LETTERMAN ARMY INSTITUTE OF RESEARCH DIV OF RES SUPP, PATH SERV GP PRESIDIO OF SAN FRANCISCO, CA 94129 SPECIES: MOUSE/ICR	CORRELATION OF GROSS AND MICROSCOPIC FINDINGS STUDY NUMBER: GLP86007 PATHOLOGIST(S): SMITH, CATHERINE D. STUDY START DATE: 01-APR-87	PRINTED: 09-AUG-88 PAGE: 20
ANIMAL NUMBER: 87C0078 DATE OF DEATH: 01-JUL 87	SEX: MALE STUDY DAY OF DEATH: 92 DOSE GROUP: 3 STUDY WEEK OF DEATH: 14 SACRIFICE STATUS: FINAL SACRIFICE TERMINAL BODY WEIGHT: 42.00 (GMS)	STUDY TYPE:
ORGAN NAME	KEYWORDS / DISTRIBUTION (SEVERITY)	
HARDBERIAN GLAND	<< P A T H O L O G Y O B S E R V A T I O N S >> GROSS FREE-TEXT COMMENTS / HISTOPATHOLOGIC FINDINGS	
*GROSS:	(TRACE) MULTIFOCAL BLACK SPECKLING	
*MICRO:	NONE	
	BILATERAL	

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 SPECIES: MOUSE/ICR

CORRELATION OF GROSS AND MICROSCOPIC FINDINGS  
 STUDY NUMBER: GLP86007  
 PATHOLOGIST(S): SMITH, CATHERINE D.  
 STUDY START DATE: 01-APR-87

PRINTED: 09-AUG-88  
 PAGE: 24

ANIMAL NUMBER: 87C0062  
 DATE OF DEATH: 01-JUL-87  
 SEX: MALE  
 STUDY DAY OF DEATH: 92  
 DOSE GROUP: 4  
 STUDY WEEK OF DEATH: 14  
 SACRIFICE STATUS: FINAL SACRIFICE  
 TERMINAL BODY WEIGHT: 39.00 (GMS)

STUDY TYPE:

ORGAN NAME  
 HARDERIAN GLAND  
 \*GROSS: (TRACE) MULTIFOCAL BLACK SPECKLING  
 \*MICRO: NOT SPECIFIED(MODERATE)

KEYWORDS / DISTRIBUTION (SEVERITY)  
 << PATHOLOGY OBSERVATIONS >>  
 GROSS FREE-TEXT COMMENTS / HISTOPATHOLOGIC FINDINGS  
 BILATERAL  
 PORPHYRIN PIGMENT

LETTERMAN ARMY INSTITUTE OF RESEARCH		CORRELATION OF GROSS AND MICROSCOPIC FINDINGS		PRINTED: 09-AUG-88
DIV OF RES SUPP, PATH SERV GP		STUDY NUMBER: GLP86007		PAGE: 27
PRESIDIO OF SAN FRANCISCO, CA 94129		PATHOLOGIST(S): SMITH, CATHERINE D.		
SPECIES: MOUSE/ICR		STUDY START DATE: 01-APR-87		STUDY TYPE:
ANIMAL NUMBER: 87C0073		SEX: MALE	DOSE GROUP: 4	SACRIFICE STATUS: FINAL SACRIFICE
DATE OF DEATH: 01-JUL-87	STUDY DAY OF DEATH: 92	STUDY WEEK OF DEATH: 14	TERMINAL BODY WEIGHT: 37.00 (GMS)	
<< P A T H O L O G Y		O B S E R V A T I O N S >>		
ORGAN NAME	KEYWORDS / DISTRIBUTION (SEVERITY)	GROSS FREE-TEXT COMMENTS / HISTOPATHOLOGIC FINDINGS		
ACCESSORY SEX OR	(MILD) ENLARGED.2.PREPUTIAL GLAND	PREPUTIAL GLAND		
*GROSS:	ABNORMAL COLOR CENTRAL PALOR			
*MICRO:	NOT SPECIFIED(TRACE)	DILATED DUCTS, PREPUTIAL GLANDS		

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 PRESIDIO OF SAN FRANCISCO, CA 94129  
 SPECIES: MOUSE/ICR

CORRELATION OF GROSS AND MICROSCOPIC FINDINGS  
 STUDY NUMBER: GLP86007  
 PATHOLOGIST(S): SMITH, CATHERINE D.  
 STUDY START DATE: 01-APR-87

PRINTED: 09-AUG-88  
 PAGE: 38

ANIMAL NUMBER: 87C0116  
 DATE OF DEATH: 02-JUL-87  
 SEX: FEMALE  
 STUDY DAY OF DEATH: 93  
 DOSE GROUP: 1  
 STUDY WEEK OF DEATH: 14  
 SACRIFICE STATUS: FINAL SACRIFICE  
 TERMINAL BODY WEIGHT: 27.00 (GMS)

STUDY TYPE:

ORGAN NAME      KEYWORDS / DISTRIBUTION (SEVERITY)      OBSERVATIONS      GROSS FREE-TEXT COMMENTS / HISTOPATHOLOGIC FINDINGS

HARDERIAN GLAND      << P A T H O L O G Y      >>      PORPHYRIN PIGMENT

\*GROSS: (MILD) MULTIFOCAL BLACK SPECKLING  
 \*MICRO: NOT SPECIFIED(TRACE)

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 SPECIES: MOUSE/ICR

CORRELATION OF GROSS AND MICROSCOPIC FINDINGS  
 STUDY NUMBER: GLP86007  
 PATHOLOGIST(S): SMITH, CATHERINE D.  
 STUDY START DATE: 01-APR-87

PRINTED: 09-AUG-88  
 PAGE: 45

STUDY TYPE:

ANIMAL NUMBER: 87C0144  
 DATE OF DEATH: 02-JUL-87  
 SEX: FEMALE  
 STUDY DAY OF DEATH: 93  
 DOSE GROUP: 2  
 STUDY WEEK OF DEATH: 14  
 SACRIFICE STATUS: FINAL SACRIFICE  
 TERMINAL BODY WEIGHT: 31.00 (GMS)

ORGAN NAME  
 HARDERIAN GLAND  
 \*GROSS: (TRACE) MULTIFOCAL BLACK SPECKLING  
 \*MICRO: NOT SPECIFIED(TRACE)

KEYWORDS / DISTRIBUTION (SEVERITY)  
 << P A T H O L O G Y O B S E R V A T I O N S >>  
 GROSS FREE-TEXT COMMENTS / HISTOPATHOLOGIC FINDINGS

PORPHYRIN PIGMENT



LETTERMAN ARMY INSTITUTE OF RESEARCH  
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 SPECIES: MOUSE/ICR

CORRELATION OF GROSS AND MICROSCOPIC FINDINGS  
 STUDY NUMBER: GLP86007  
 PATHOLOGIST(S): SMITH, CATHERINE D.  
 STUDY START DATE: 01-APR-87

PRINTED: 09-AUG-88  
 PAGE: 47

ANIMAL NUMBER: 87C0158  
 DATE OF DEATH: 02-JUL-87  
 STUDY DAY OF DEATH: 93  
 SEX: FEMALE  
 DOSE GROUP: 2  
 SACRIFICE STATUS: FINAL SACRIFICE  
 STUDY WEEK OF DEATH: 14  
 TERMINAL BODY WEIGHT: 33.00 (GMS)

STUDY TYPE:

ORGAN NAME  
 ADRENAL

KEYWORDS / DISTRIBUTION (SEVERITY)  
 << P A T H O L O G Y O B S E R V A T I O N S >>  
 GROSS FREE-TEXT COMMENTS / HISTOPATHOLOGIC FINDINGS

\*GROSS: ECTOPIC  
 \*MICRO: NONE

1MM FOCUS NEXT TO LEFT ADRENAL. MAY BE LYMPH NODE

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 SPECIES: MOUSE/ICR

CORRELATION OF GROSS AND MICROSCOPIC FINDINGS  
 STUDY NUMBER: GLP86007  
 PATHOLOGIST(S): SMITH, CATHERINE D.  
 STUDY START DATE: 01-APR-87

PRINTED: 09-AUG-88  
 PAGE: 51

STUDY TYPE:

ANIMAL NUMBER: 87C0109  
 DATE OF DEATH: 14-MAY-87  
 SEX: FEMALE  
 STUDY DAY OF DEATH: 44  
 DOSE GROUP: 3  
 STUDY WEEK OF DEATH: 7  
 SACRIFICE STATUS: INTERIM SACRIFICE 2  
 TERMINAL BODY WEIGHT: 32.00 (GMS)

ORGAN NAME  
 KEYWORDS / DISTRIBUTION (SEVERITY)  
 << P A T H O L O G Y O B S E R V A T I O N S >>  
 GROSS FREE-TEXT COMMENTS / HISTOPATHOLOGIC FINDINGS

OVARIES  
 \*GROSS: PARA-OVARIAN CYST(S)  
 \*MICRO: NOT SPECIFIED (PRESENT)

OVARIES ENCASED IN .25 TO .30 ML CLEAR CYST. OVARIES APPEAR  
 NORMAL.  
 PARA-OVARIAN CYST(S)

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 PRESIDIO OF SAN FRANCISCO, CA 94129  
 SPECIES: MOUSE/ICR

CORRELATION OF GROSS AND MICROSCOPIC FINDINGS  
 STUDY NUMBER: GLP86007  
 PATHOLOGIST(S): SMITH, CATHERINE D.  
 STUDY START DATE: 01-APR-87

PRINTED: 09-AUG-88  
 PAGE: 53

STUDY TYPE:

ANIMAL NUMBER: 87C0118  
 DATE OF DEATH: 02-JUL-87  
 SEX: FEMALE  
 DOSE GROUP: 3  
 STUDY WEEK OF DEATH: 14  
 SACRIFICE STATUS: FINAL SACRIFICE  
 TERMINAL BODY WEIGHT: 31.00 (GMS)

ORGAN NAME  
 SPLEEN

KEYWORDS / DISTRIBUTION (SEVERITY)

<< P A T H O L O G Y O B S E R V A T I O N S >>  
 GROSS FREE-TEXT COMMENTS / HISTOPATHOLOGIC FINDINGS

\*GROSS: (TRACE) MODULAR SURFACE  
 \*MICRO: NOT SPECIFIED(TRACE)

1MM WHITE FOCUS  
 MYELOID HYPERPLASIA

LETTERMAN ARMY INSTITUTE OF RESEARCH	CORRELATION OF GROSS AND MICROSCOPIC FINDINGS		PRINTED: 09-AUG-88
DIV OF RES SUPP, PATH SERV GP	STUDY NUMBER: GLP86007		PAGE: 54
PRESIDIO OF SAN FRANCISCO, CA 94129	PATHOLOGIST(S): SMITH, CATHERINE D.		
SPECIES: MOUSE/ICR	STUDY START DATE: 01-APR-87		STUDY TYPE:
ANIMAL NUMBER: 87C0122	SEX: FEMALE	DOSE GROUP: 3	SACRIFICE STATUS: FINAL SACRIFICE
DATE OF DEATH: 02-JUL-87	STUDY DAY OF DEATH: 93	STUDY WEEK OF DEATH: 14	TERMINAL BODY WEIGHT: 28.00 (GMS)
	<< P A T H O L O G Y    O B S E R V A T I O N S    >>		
ORGAN NAME	KEYWORDS / DISTRIBUTION (SEVERITY)	GROSS FREE-TEXT COMMENTS / HISTOPATHOLOGIC FINDINGS	
HARDERIAN GLAND	PORPHYRIN PIGMENT		
*GROSS: (TRACE) MULTIFOCAL BLACK SPECKLING			
*MICRO: NOT SPECIFIED(TRACE)			

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 SPECIES: MOUSE/ICR

CORRELATION OF GROSS AND MICROSCOPIC FINDINGS  
 STUDY NUMBER: GLP86007  
 PATHOLOGIST(S): SMITH, CATHERINE D.  
 STUDY START DATE: 01-APR-87

PRINTED: 09-AUG-88  
 PAGE: 58

ANIMAL NUMBER: 87C0107  
 DATE OF DEATH: 14-MAY-87  
 STUDY DAY OF DEATH: 44  
 SEX: FEMALE  
 DOSE GROUP: 4  
 SACRIFICE STATUS: INTERIM SACRIFICE 2  
 STUDY WEEK OF DEATH: 7  
 TERMINAL BODY WEIGHT: 26.00 (GMS)

STUDY TYPE:

ORGAN NAME: << P A T H O L O G Y O B S E R V A T I O N S >>  
 KEYWORDS / DISTRIBUTION (SEVERITY) GROSS FREE-TEXT COMMENTS / HISTOPATHOLOGIC FINDINGS

OVARIES

\*GROSS: PARA-OVARIAN CYST(S) LEFT OVARIAN CYST 4 ML X 5 ML. RIGHT OVARY SLIGHTLY ENLARGED.  
 \*MICRO: NONE

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 PRESIDIO OF SAN FRANCISCO, CA 94129  
 SPECIES: MOUSE/ICR  
 ANIMAL NUMBER: 87C0180  
 DATE OF DEATH: 02-JUL-87  
 STUDY DAY OF DEATH: 93  
 SEX: FEMALE  
 DOSE GROUP: 4  
 STUDY WEEK OF DEATH: 14  
 SACRIFICE STATUS: FINAL SACRIFICE  
 TERMINAL BODY WEIGHT: 26.00 (GMS)  
 PATHOLOGIST(S): SMITH, CATHERINE D.  
 STUDY START DATE: 01-APR-87  
 STUDY TYPE:  
 CORRELATION OF GROSS AND MICROSCOPIC FINDINGS  
 STUDY NUMBER: GLP86007  
 PRINTED: 09-AUG-88  
 PAGE: 63  
 ORGAN NAME  
 HARDERIAN GLAND  
 \*GROSS: (TRACE) MULTIFOCAL BLACK SPECKLING  
 \*MICRO: NONE  
 << P A T H O L O G Y O B S E R V A T I O N S >>  
 KEYWORDS / DISTRIBUTION (SEVERITY)  
 GROSS FREE-TEXT COMMENTS / HISTOPATHOLOGIC FINDINGS

PRINTED: 31-AUG-88  
PAGE: 1

GROUP/ DAY OF				SUBCHRONIC/90 DAY FEEDING										
ANIMAL				STUDY START DATE: 01-APR-87										
ANIMAL	SEX	SUBGROUP	STUDY	AST	BUN	CK	ALB	BILI	CL	GLU	IRON	ALK	LOHL	MAG
87C0022	M	5/1	2	117.6	32.4	253.3	2.66	NT	109.	233.4	367.	105.7	618.7	2.48
87C0029	M	5/1	2	235.2	23.0	260.9	2.52	NT	108.	293.0	422.	99.6	699.9	2.37
87C0053	M	5/1	2	172.5	29.7	666.7	2.92	NT	113.	186.5	311.	118.6	729.5	2.39
87C0060	M	5/1	2	NT	NT	NT	NT	NT	113.	NT	NT	79.7	NT	2.56
87C0074	M	5/1	2	92.9	29.0	274.4	2.67	NT	115.	271.4	340.	70.6	574.8	2.25
87C0076	M	5/1	2	75.8	31.5	278.0	2.44	NT	111.	250.0	287.	97.8	564.4	2.32
87C0089	M	5/1	2	74.0	21.4	160.1	2.41	NT	111.	299.3	314.	66.8	220.1	2.25
87C0091	M	5/1	2	125.5	27.8	1091.7	2.72	NT	112.	253.5	396.	136.5	607.8	2.41
87C0097	M	5/1	2	117.8	23.3	192.8	2.64	NT	111.	258.4	237.	94.2	286.7	2.07
PARAMETER MEANS:				126.41	27.26	397.24	2.62	-	111.44	255.69	334.25	96.61	537.74	2.34
STANDARD DEVIATIONS:				54.17	4.17	321.05	0.17	-	2.13	35.60	60.07	22.43	185.37	0.14

## Appendix Q (cont.): BASELINE CONTROL DATA

LETTERMAN ARMY INSTITUTE OF RESEARCH  
 DIV OF RES SUPP, PATH SERV GP  
 PRESIDIO OF SAN FRANCISCO, CA 94129  
 MOUSE/ICR

PRINTED: 31-AUG-88  
 PAGE: 2

EXPANDED STATISTICAL TABLE FOR COBAS I  
 STUDY NUMBER: 86007CHM

SUBCHRONIC/90 DAY FEEDING  
 STUDY START DATE: 01-APR-87

ANIMAL NUMBER	SEX	GROUP/ SUBGROUP	DAY OF STUDY	NA	CAL	CHOL	CR	ALT
87C0022	M	5/1	2	158.	4.3	65.9	1.94	57.7
87C0029	M	5/1	2	154.	9.2	116.3	.59	100.8
87C0053	M	5/1	2	156.	9.1	23.3	.36	32.9
87C0060	M	5/1	2	150.	9.1	NT	.51	87.2
87C0074	M	5/1	2	158.	8.5	81.9	.51	24.7
87C0076	M	5/1	2	158.	9.6	105.8	.50	40.3
87C0089	M	5/1	2	160.	9.4	88.0	.57	31.6
87C0091	M	5/1	2	158.	8.7	111.2	.52	33.4
87C0097	M	5/1	2	158.	9.5	92.6	.54	114.5
PARAMETER MEANS:				156.67	9.16	85.63	0.67	58.12
STANDARD DEVIATIONS:				3.00	0.36	30.10	0.48	33.97



## Appendix Q (cont.): BASELINE CONTROL DATA

LETTERMAN ARMY INSTITUTE OF RESEARCH  
DIV OF RES SUPP, PATH SERV GP  
PRESIDIO OF SAN FRANCISCO, CA 94129  
HOUSE/ICR

PRINTED: 31-AUG-88  
PAGE: 1

EXPANDED STATISTICAL TABLE FOR COBAS II  
STUDY NUMBER: 86007CHM

STUDY START DATE: 01-APR-87 SUBCHRONIC/90 DAY FEEDING

ANIMAL NUMBER	SEX	GROUP/ SUBGROUP	DAY OF STUDY	TP	URIC	K	TRIG	A-G
87C0022	M	5/1	2	4.7	1.0	5.8	NT	1.31
87C0029	M	5/1	2	4.5	.7	5.6	NT	1.29
87C0053	M	5/1	2	4.6	.7	5.6	NT	1.77
87C0060	M	5/1	2	5.0	NT	6.4	NT	NT
87C0074	M	5/1	2	5.1	.9	4.7	NT	1.12
87C0076	M	5/1	2	4.8	1.2	7.0	NT	1.04
87C0089	M	5/1	2	4.6	1.0	5.6	NT	1.10
87C0091	M	5/1	2	5.1	.8	5.4	NT	1.14
87C0097	M	5/1	2	4.8	1.5	5.2	NT	1.23
PARAMETER MEANS:				4.80	0.98	5.70	-	1.25
STANDARD DEVIATIONS:				0.22	0.27	0.67	-	0.23

## Appendix Q (cont.): BASELINE CONTROL DATA

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EXPANDED STATISTICAL TABLE FOR COBAS I  
STUDY NUMBER: 86007CHM

DIV OF RES SUPP, PAIR SERV OF  
PRESIDIO OF SAN FRANCISCO, CA 94129  
MOUSE/1CR

SUBCHRONIC/90 DAY FEEDING

STUDY START DATE: 01-APR-87

ANIMAL NUMBER	SEX	GROUP/ SUBGROUP	DAY OF STUDY	AST	BUN	CK	ALB	BILI	CL	GLU	IRON	ALK	LDHL	MAG
87C0110	F	5/2	1	141.5	28.7	451.0	2.74	NT	115.	184.5	276.	95.7	704.0	2.61
87C0113	F	5/2	1	85.7	27.8	248.3	2.93	NT	111.	162.2	395.	99.2	484.3	2.56
87C0119	F	5/2	1	151.4	27.3	333.1	2.93	NT	115.	173.0	339.	130.8	812.6	2.76
87C0131	F	5/2	1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
87C0136	F	5/2	1	127.6	24.1	366.2	2.56	NT	113.	234.3	261.	111.6	432.8	2.48
87C0137	F	5/2	1	NT	NT	NT	NT	NT	113.	NT	NT	NT	NT	2.37
87C0138	F	5/2	1	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT
87C0147	F	5/2	1	72.4	28.1	240.9	2.78	NT	115.	210.3	314.	60.8	431.5	2.27
87C0170	F	5/2	1	79.1	24.0	249.9	2.82	NT	113.	228.8	286.	124.6	518.8	2.61
87C0172	F	5/2	1	110.3	20.7	262.0	2.78	NT	113.	213.4	240.	107.5	359.9	2.53
								-	113.50	200.93	301.57	104.31	534.84	2.52
				PARAMETER MEANS:	111.14	25.81	2.79	-	1.41	27.94	52.63	22.99	163.44	0.15
				STANDARD DEVIATIONS:	31.81	2.95	0.13	-	-	-	-	-	-	-

## Appendix Q (cont.): BASELINE CONTROL DATA

LETTERMAN ARMY INSTITUTE OF RESEARCH  
DIV OF RES SUPP, PATH SERV GP  
PRESIDENT OF SAN FRANCISCO, CA 94129  
MOUSE/ICR

EXPANDED STATISTICAL TABLE FOR COBAS I  
STUDY NUMBER: 86007CHM

PRINTED: 11 AUG-88  
PAGE: 2

STUDY START DATE: 01-APR-87 SUBCHRONIC/90 DAY FLEETING

ANIMAL NUMBER	SEX	GROUP/ SUBGROUP	DAY OF STUDY	NA	CAL	CHOL	CR	ALT
87C0110	F	5/2	1	158.	9.0	64.0	.51	41.3
87C0113	F	5/2	1	160.	9.4	72.1	.65	26.8
87C0119	F	5/2	1	162.	9.7	56.7	1.17	32.8
87C0131	F	5/2	1	158.	NT	NT	NT	NT
87C0136	F	5/2	1	156.	9.2	48.4	.45	31.4
87C0137	F	5/2	1	158.	8.8	NT	NT	NT
87C0138	F	5/2	1	158.	NT	NT	NT	NT
87C0147	F	5/2	1	158.	9.6	84.4	.59	40.4
87C0170	F	5/2	1	156.	9.7	74.8	.55	26.1
87C0172	F	5/2	1	160.	9.6	59.3	.44	48.9
PARAMETER MEANS:				158.40	9.38	65.67	0.62	35.39
STANDARD DEVIATIONS:				1.84	0.34	12.23	0.25	8.42

## Appendix Q (cont.): BASELINE CONTROL DATA

PRINTED: 31-AUG-88  
PAGE: 1EXPANDED STATISTICAL TABLE FOR COBAS II  
STUDY NUMBER: 86007CHM

SUBCHRONIC/90 DAY FEEDING

LETTERMAN ARMY INSTITUTE OF RESEARCH  
DIV OF RES SUPP, PATH SERV GP  
PRESIDIO OF SAN FRANCISCO, CA 94129  
HOUSE/ICR

STUDY START DATE: 01-APR-87

ANIMAL NUMBER	SEX	GROUP/ SUBGROUP	DAY OF STUDY	TP	URIC	K	TRIG	A-G
87C0110	F	5/2	1	4.9	.5	4.9	NT	1.29
87C0113	F	5/2	1	5.0	1.2	5.2	NT	1.44
87C0119	F	5/2	1	5.0	.4	5.5	NT	1.4
87C0131	F	5/2	1	NT	NT	4.9	NT	NT
87C0136	F	5/2	1	4.5	.5	6.4	NT	1.33
87C0137	F	5/2	1	NT	NT	4.9	NT	NT
87C0138	F	5/2	1	NT	NT	6.5	NT	NT
87C0147	F	5/2	1	4.8	1.1	5.1	NT	1.34
87C0170	F	5/2	1	5.0	.6	5.9	NT	1.29
87C0172	F	5/2	1	4.7	1.4	6.2	NT	1.48
PARAMETER MEANS:				4.84	0.81	5.55	-	1.37
STANDARD DEVIATIONS:				0.19	0.41	0.65	-	0.07

## Appendix Q (cont.): BASELINE CONTROL DATA

LETTERMAN ARMY INSTITUTE OF RESEARCH			EXPANDED STATISTICAL TABLE FOR COULTER COUNTER					PRINTED: 22-AUG-88	
DIV OF RES SUPP, PATH SERV GP			STUDY NUMBER: GLP86007					PAGE: 1	
PRESIDIO OF SAN FRANCISCO, CA 94129			1st SCHEDULED DATE: 01-APR-87 (DAY OF DOSAGE					1) FOR SUBGROUPS 1 2	
SPECIES: MOUSE/ICR			STUDY START DATE: 01-APR-87					STUDY TYPE:	
ANIMAL NO/SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	WBC	RBC	HGB	HCT	MCV	MCH	MCHC
87C0022/M	5/1	01-APR-87	3.200	8.410	14.60	41.00	49.00	17.60	35.70
87C0029/M	5/1	01-APR-87	2.400	7.230	13.00	36.10	50.00	18.00	36.10
87C0053/M	5/1	01-APR-87	1.900	8.620	17.80	48.90	51.00	18.60	36.40
87C0060/M	5/1	01-APR-87	1.800	8.630	15.00	41.10	48.00	17.40	36.60
87C0068/M	5/1	01-APR-87	3.000	7.010	13.10	35.60	51.00	18.80	37.00
87C0074/M	5/1	01-APR-87	1.800	7.320	12.70	36.90	50.00	17.50	34.50
87C0076/M	5/1	01-APR-87	1.300	7.410	13.30	37.60	51.00	18.00	35.50
87C0089/M	5/1	01-APR-87	2.300	8.450	14.80	41.30	49.00	17.60	35.90
87C0091/M	5/1	01-APR-87	2.000	8.960	17.80	46.10	51.00	19.90	38.80
87C0097/M	5/1	01-APR-87	2.100	5.260	12.80	38.70	53.00	17.70	33.10
PARAMETER MEANS:			2.180	7.730	14.49	40.33	50.30	18.11	35.96
STANDARD DEVIATIONS:			0.5731	1.117	1.941	4.357	1.418	0.7824	1.504

## Appendix Q (cont.): BASELINE CONTROL DATA

LETTERMAN ARMY INSTITUTE OF RESEARCH			EXPANDED STATISTICAL TABLE FOR COULTER COUNTER					STUDY NUMBER: GLP86007			STUDY TYPE:				
DIV OF RES SUPP, PATH SERV GP			1st SCHEDULED DATE: 01-APR-87 (DAY OF DOSAGE)					1) FOR SUBGROUPS 1 2			PAGE: 1				
PRESIDIO OF SAN FRANCISCO, CA 94129			STUDY START DATE: 01-APR-87					STUDY START DATE: 01-APR-87			PRINTED: 14-NOV-88				
SPECIES: MOUSE/ICR															
ANIMAL NO/SEX	GROUP/ SUBGROUP	DATE DATA TAKEN	WBC	RBC	HGB	HCT	MCV	MCH	MCHC						
87C0110/F	5/2	01-APR-87	1.400	7.490	13.90	37.90	51.00	18.60	36.60						
87C0113/F	5/2	01-APR-87	2.700	7.910	14.70	40.30	51.00	18.60	36.50						
87C0119/F	5/2	01-APR-87	1.100	7.030	12.70	34.90	49.00	18.10	36.40						
87C0131/F	5/2	01-APR-87	1.100	8.850	15.10	43.30	49.00	17.20	35.10						
87C0131/F	5/2	01-APR-87	1.300	7.670	13.30	37.50	49.00	17.40	35.60						
87C0136/F	5/2	01-APR-87	1.600	7.810	15.90	43.90	50.00	18.10	36.30						
87C0137/F	5/2	01-APR-87	2.400	8.460	14.80	41.70	49.00	17.60	35.60						
87C0138/F	5/2	01-APR-87	0.9000	6.110	10.90	30.30	49.00	17.80	35.90						
87C0147/F	5/2	01-APR-87	1.900	9.880	17.70	49.30	50.00	17.90	35.90						
87C0170/F	5/2	01-APR-87	2.000	7.430	15.10	42.90	51.00	18.00	35.40						
87C0172/F	5/2	01-APR-87	1.640	7.864	14.41	40.20	49.80	17.93	35.93						
PARAMETER MEANS:			0.5967	1.029	1.855	5.316	0.9189	0.4596	0.5079						
STANDARD DEVIATIONS:															

PRINTED: 13-SEP-88  
PAGE: 1  
STUDY TYPE:

SUMMARY STATISTICS FOR ABSOLUTE ORGAN WEIGHTS (GMS)  
STUDY NUMBER: GLP6007  
REPORT FOR INTERIM SACRIFICE NUMBER (ALL SUBGROUPS)  
STUDY START DATE: 01-APR-87

ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	BRAIN	LIVER	KIDNEY	HEART	SPLEEN	ADRENAL	OVARIES	TESTES
22/M	5/1	30.00	0.503	2.002	0.426	0.124	0.098			0.229
29/M	5/1	33.00	0.480	2.029	0.291	0.126	0.062			0.248
53/M	5/1	29.00	0.478	1.817	0.512	0.154	0.550			0.221
60/M	5/1	32.00	0.477	2.019	0.545	0.153	0.114			0.269
68/M	5/1	32.00	0.468	2.053	0.530	0.177	0.088			0.201
74/M	5/1	33.00	0.470	2.025	0.581	0.146	0.111			0.216
76/M	5/1	31.00	0.478	1.691	0.508	0.167	0.100			0.214
89/M	5/1	31.00	0.489	1.931	0.466	0.185	0.096			0.217
91/M	5/1	32.00	0.518	2.109	0.530	0.139	0.097			0.225
97/M	5/1	33.00	0.556	1.940	0.512	0.155	0.155			0.234
		M E A N :	0.492	1.962	0.490	0.153	0.147			0.227
		STANDARD DEVIATION:	0.027	0.124	0.082	0.020	0.143			0.019

LETTERMAN ARMY INSTITUTE OF RESEARCH  
DIV OF RES SUPP, PATH SERV GP  
PRESIDIO OF SAN FRANCISCO, CA 94129  
SPECIES: MOUSE/ICR

SUMMARY STATISTICS FOR % ORGAN TO BODY WEIGHT RATIO

STUDY NUMBER: GLP6007

REPORT FOR INTERIM SACRIFICE NUMBER (ALL SUBGROUPS)

STUDY START DATE: 01-APR-87

PRINTED: 13-SEP-88  
PAGE: 1

STUDY TYPE:

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**STUDY TYPE:**

ANIMAL NC/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	BRAIN	LIVER	KIDNEY	HEART	SPLEEN	ADRENAL	OVARIES	TESTES
22/M	5/1	30.00	1.677	6.673	1.420	0.413	0.327			0.763
29/M	5/1	33.00	1.455	6.148	0.882	0.382	0.188			0.752
53/M	5/1	29.00	1.648	6.266	1.766	0.531	1.897			0.762
60/M	5/1	32.00	1.491	6.309	1.703	0.478	0.356			0.841
68/M	5/1	32.00	1.462	6.416	1.656	0.553	0.275			0.628
74/M	5/1	33.00	1.424	6.136	1.761	0.442	0.336			0.655
76/M	5/1	31.00	1.542	5.455	1.639	0.539	0.323			0.690
89/M	5/1	31.00	1.577	6.229	1.503	0.597	0.310			0.700
91/M	5/1	32.00	1.619	6.591	1.656	0.634	0.303			0.703
97/M	5/1	33.00	1.685	5.879	1.685	0.470	0.470			0.709
M E A N:			1.558	6.210	1.554	0.484	0.478			0.720
STANDARD DEVIATION:			0.097	0.350	0.260	0.069	0.503			0.061



## Appendix Q (cont.): BASELINE CONTROL DATA

LETTERMAN ARMY INSTITUTE OF RESEARCH			SUMMARY STATISTICS FOR % ORGAN TO BRAIN WEIGHT RATIO							PRINTED: 13-SEP-88	
DIV OF RES SUPP, PATH SERV GP			STUDY NUMBER: GLP86007							PAGE: 1	
PRESIDIO OF SAN FRANCISCO, CA 94129			REPORT FOR INTERIM SACRIFICE NUMBER (ALL SUBGROUPS)							STUDY TYPE:	
SPECIES: MOUSE/ICR			STUDY START DATE: 01-APR-87								
ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	BRAIN	LIVER	KIDNEY	HEART	SPLEEN	ADRENAL	OVARIES	TESTES	
22/M	5/1	30.00	100.000	398.012	84.692	24.652	19.483			45.527	
29/M	5/1	33.00	100.000	422.708	60.625	26.250	12.917			51.667	
53/M	5/1	29.00	100.000	380.126	107.113	32.218	115.063			46.234	
60/M	5/1	32.00	100.000	423.270	114.256	32.075	23.899			56.394	
68/M	5/1	32.00	100.000	438.675	113.248	37.821	18.803			42.949	
74/M	5/1	33.00	100.000	430.851	123.617	31.064	23.617			45.957	
76/M	5/1	31.00	100.000	353.766	106.276	34.937	20.921			44.770	
89/M	5/1	31.00	100.000	394.888	95.297	37.832	19.632			44.376	
91/M	5/1	32.00	100.000	407.143	102.317	26.834	18.726			43.436	
97/M	5/1	33.00	100.000	348.921	92.086	27.878	27.878			42.086	
MEAN:			100.000	399.836	99.953	31.156	30.094			46.340	
STANDARD DEVIATION:			0.000	31.140	17.955	4.727	30.116			4.405	

## Appendix Q (cont.): BASELINE CONTROL DATA

LETTERMAN ARMY INSTITUTE OF RESEARCH			SUMMARY STATISTICS FOR ABSOLUTE ORGAN WEIGHTS (GMS)					PRINTED: 13-SEP-88		
DIV OF RES SUPP, PATH SERV GP			STUDY NUMBER: GLP86007					PAGE: 1		
PRESIDIO OF SAN FRANCISCO, CA 94129			REPORT FOR INTERIM SACRIFICE NUMBER (ALL SUBGROUPS)							
SPECIES: MOUSE/ICR			STUDY START DATE: 01-APR-87					STUDY TYPE:		
ANIMAL NO/SEX	GROUP/ SUBGROUP	TERMINAL BODY WT. GMS	BRAIN	LIVER	KIDNEY	HEART	SPLEEN	ADRENAL	OVARIES	TESTES
110/F	5/2	26.00	0.511	1.640	0.302	0.164	0.088		0.019	
113/F	5/2	27.00	0.537	1.538	0.328	0.141	0.085		0.025	
119/F	5/2	23.00	0.439	1.119	0.299	0.115	0.050		0.036	
131/F	5/2	24.00	0.507	1.378	0.287	0.123	0.068		0.046	
136/F	5/2	26.00	0.518	1.550	0.357	0.167	0.099		0.039	
137/F	5/2	25.00	0.497	1.425	0.364	0.137	0.101		0.031	
138/F	5/2	25.00	0.525	1.369	0.307	0.172	0.104		0.036	
147/F	5/2	26.00	0.544	1.568	0.277	0.139	0.129		0.011	
170/F	5/2	27.00	0.470	1.476	0.314	0.160	0.124		0.028	
172/F	5/2	26.00	0.545	1.665	0.353	0.177	0.102		0.048	
M E A N:			0.509	1.473	0.319	0.150	0.095		0.032	
STANDARD DEVIATION:			0.034	0.160	0.030	0.021	0.024		0.012	

## Appendix Q (cont.): BASELINE CONTROL DATA

LETTERMAN ARMY INSTITUTE OF RESEARCH DIV OF RES SUPP, PATH SERV GP PRESIDIO OF SAN FRANCISCO, CA 94129 SPECIES: MOUSE/ICR			SUMMARY STATISTICS FOR % ORGAN TO BODY WEIGHT RATIO STUDY NUMBER: GLP86007 REPORT FOR INTERIM SACRIFICE NUMBER (ALL SUBGROUPS) STUDY START DATE: 01-APR-87							STUDY TYPE:	
			ADRENAL							TESTES	
			OVARIES								
			SPLEEN								
			HEART								
			KIDNEY								
			LIVER								
			BRAIN								
			TERMINAL								
			BODY WT. GMS								

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## Appendix Q (cont.): BASELINE CONTROL DATA

LETTERMAN ARMY INSTITUTE OF RESEARCH			SUMMARY STATISTICS FOR % ORGAN TO BRAIN WEIGHT RATIO					PRINTED: 13-SEP-88		
DIV OF RES SUPP, PATH SERV GP			STUDY NUMBER: GLP86007					PAGE: 1		
PRESIDIO OF SAN FRANCISCO, CA 94129			REPORT FOR INTERIM SACRIFICE NUMBER (ALL SUBGROUPS)					STUDY TYPE:		
SPECIES: MOUSE/ICR			STUDY START DATE: 01-APR-87							
ANIMAL NO/SEX	GROUP / SUBGROUP	TERMINAL BODY WT. GMS	BRAIN	LIVER	KIDNEY	HEART	SPLEEN	ADRENAL	OVARIES	TESTES
110/F	5/2	26.00	100.000	320.939	59.100	32.094	17.221		3.718	
113/F	5/2	27.00	100.000	286.406	61.080	26.257	15.829		4.655	
119/F	5/2	23.00	100.000	254.897	68.109	26.196	11.390		8.200	
131/F	5/2	24.00	100.000	271.795	56.607	24.260	13.412		9.073	
136/F	5/2	26.00	100.000	299.228	68.919	32.239	19.112		7.529	
137/F	5/2	25.00	100.000	286.720	73.239	27.565	20.322		6.237	
138/F	5/2	25.00	100.000	260.762	58.476	32.762	19.810		6.857	
147/F	5/2	26.00	100.000	288.235	50.919	25.551	23.713		2.022	
170/F	5/2	27.00	100.000	314.043	66.809	34.043	26.383		5.957	
172/F	5/2	26.00	100.000	305.505	64.771	32.477	18.716		8.807	
MEAN:			100.000	288.853	62.803	29.344	18.591		6.306	
STANDARD DEVIATION:			0.000	21.840	6.745	3.687	4.471		2.290	

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